

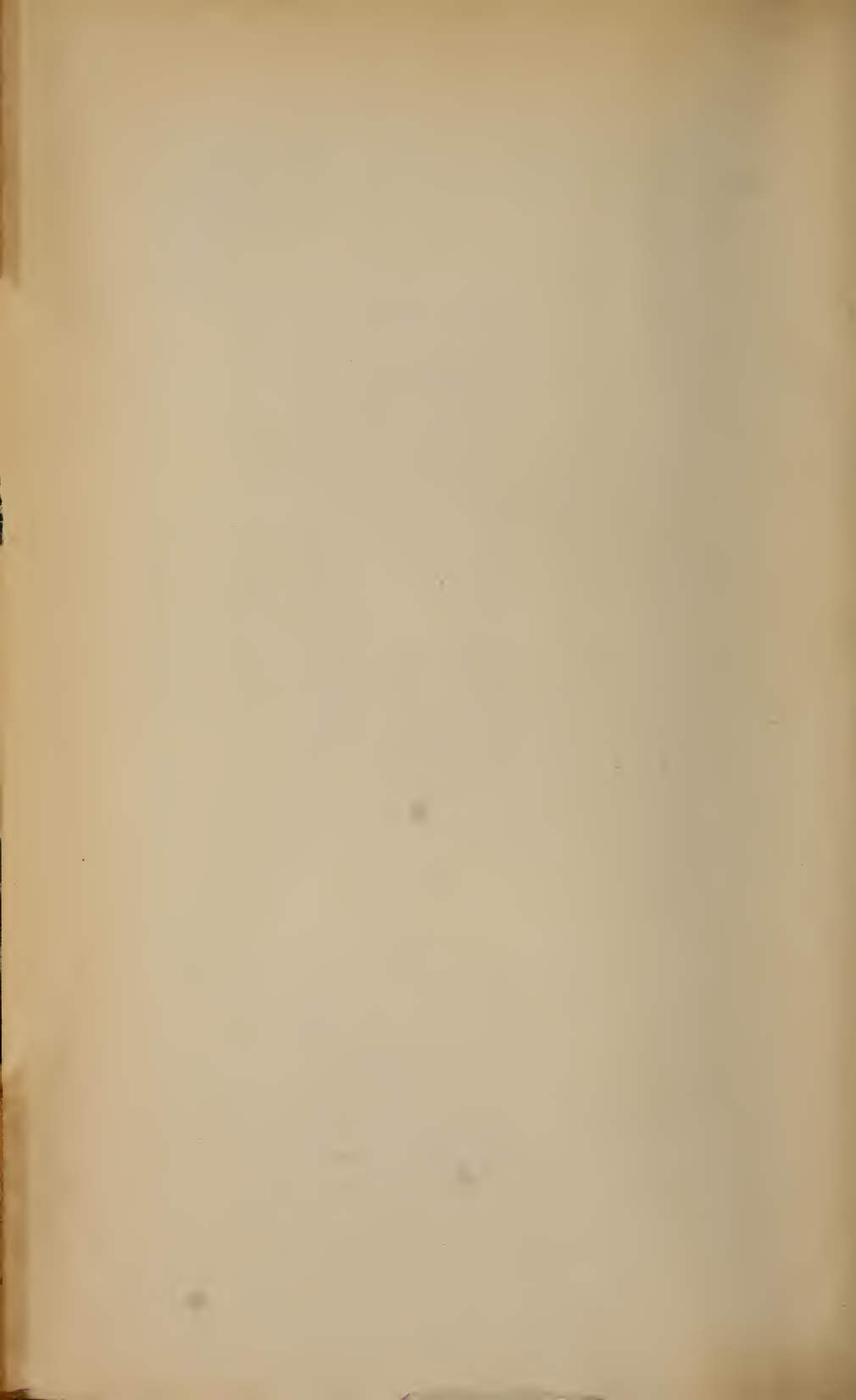




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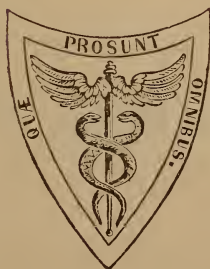




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Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of August.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies (not exceeding *fifty*) will be furnished to authors, *provided the request for them be made at the time the communication is sent to the Editors.*

The following works have been received:—

Die Heilkräfte der Sogenannten Indifferenten Thermen insbesondere bei Krankheiten des Nervensystems. Von Dr. WILH. THEODOR v. RENZ. Tübingen: Alb. Moser, 1878.
Beiträge zur Praktischen Augenheilkunde. Von Dr. J. HIRSCHBERG, Docent an der Universität zu Berlin. Leipzig: Viet & Comp., 1878.

Die Medicinal-Gesetzgebung des Deutschen Reichs und seiner Einzelstaaten. Von Dr. G. M. KLETTE. Berlin: Eugen Grosser; New York: L. W. Schmidt, 1878.

Zur Behandlung der Blutungen Nach Abort. Von PAUL F. MUNDÉ, in New York.

Guérison de Six Aveugles-nés. Par M. le Dr. LOUIS FIALLA, Chef du Service Chirurgical à l'Hôpital "Philantropie." Bucarest: Thiel & Weiss, 1878.

Études Experimentales et Cliniques sur les Traumatismes Cérébraux. Par le Dr. H. DURET, Aide d'Anatomie de la Faculté de Médecine, etc. Tome I. Paris: Aux Bureaux du Progrès Médical, 1878.

Contribution to the Study of Symptoms and Therapeutics of "Perforating Ulcer" of the Stomach. By B. LONDON, M.D. Carlsbad.

Clinical Lectures on Stricture of the Urethra and other Disorders of the Urinary Organs. By REGINALD HARRISON, F.R.C.S., Surgeon to the Royal Liverpool Infirmary, etc. London: J. & A. Churchill, 1878.

A Practical Treatise on Aural Surgery. By H. MACNAUGHTON JONES, M.D., Surgeon to Cork Ophthalmic and Aural Hosp., etc. London: J. & A. Churchill, 1878.

Atlas of the Diseases of the Skin. By BALMANNO SQUIRE, M.B., Surgeon to the British Hospital for Diseases of the Skin. Part I. London: J. & A. Churchill, 1878.

Insanity in Ancient and Modern Life, with chapters on its Prevention. By DANIEL HACK TUKE, M.D., F.R.C.S., Lond. London: MacMillan & Co., 1878.

The Throat and its Diseases. By LENNOX BROWNE, F.R.C.S.E. Ed., Sen. Surg. to Central London Throat and Ear Hosp., etc. London: Baillière, Tindall & Cox, 1878.

The Antidotal Treatment of Diseases. By JOHN PARKIN, M.D. London: Hardwicke & Bogue, 1878.

The Pathology of Pulmonary Consumption. Three Lectures, by T. HENRY GREEN, M.D., F.R.C.P., Phys. to Charing Cross Hospital. London: Henry Renshaw, 1878.

The Pathology and Treatment of Membranous Dysmenorrhœa. By JOHN WILLIAMS, M.D. London, 1878.

Medical Women; a Statement and an Argument. By CHARLES WEST, M.D. London: J. & A. Churchill, 1878.

Cholera in Relation to certain Physical Phenomena. By T. R. LEWIS, M.B., and D. D. CUNNINGHAM, M.D. Calcutta, 1878.

Diseases of the Hip-Joint. By JAMES G. BEAVEY, F.R.C.S., Melbourne, 1878.

History and Progress of Surgery. By JAMES G. BEANEY, F.R.C.S.E. Melbourne: F. F. Baillière, 1877.

Personal Protection against Yellow Fever. By JOHN A. WEGG, M.D. Kingston, Jamaica, 1878.

Montreal General Hospital Pathological Report for the year ending May 1, 1877. By WILLIAM OSLER, M.D. Vol. I. Montreal: Dawson Brothers, 1878.

Nervous Diseases: their Description and Treatment. By ALLAN McLANE HAMILTON, M.D., Attending Phys. to the Epileptic and Paralytic Hospital, Blackwell's Island, N. Y. Philadelphia: H. C. Lea, 1878.

A Manual of Operative Surgery. By LEWIS A. STIMSON, B.A., M.D., Surgeon to the Presbyterian Hospital, New York. Philadelphia: H. C. Lea, 1878.

Lectures on Diseases of the Nervous System. Delivered at Guy's Hospital. By SAMUEL WILKS, M.D., F.R.S. Philadelphia: Lindsay & Blakiston, 1878.

Handbook of Ophthalmology. By Prof. C. SCHWEIGGER, of the University of Berlin. Translated from the third German Edition by PORTER FARLEY, M.D., Rochester, N. Y. Philadelphia: J. B. Lippincott & Co., 1878.

Atlas of Skin Diseases. By LOUIS A. DUHRING, M.D., Prof. of Skin Dis. in Hospital of Univ. of Penna. Part III. Philadelphia: J. B. Lippincott & Co. 1878.

Congenital Occlusion and Dilatation of Lymph Channels. By SAMUEL C. BUSEY, M.D., Prof. of Theory and Prac. of Med. Univ. of Georgetown, etc. New York: William Wood & Co., 1878.

Studies on Pathological Anatomy. By FRANCIS DELAFIELD, M.D. No. 5. New York: William Wood & Co., 1878.

Visions: a Study of False Sight. By EDWARD H. CLARKE, M.D. With an Introduction and Memorial Sketch by OLIVER WENDELL HOLMES, M.D. Boston: Houghton, Osgood & Co., 1878.

Abbreviations of Titles of Medical Periodicals to be used in the Subject-Catalogue of the Library of the Surgeon-General's Office. Washington, 1878.

Prescription Writing. By FREDERIC HENRY GERRISH, M.D. Second Ed. Portland: Loring, Short and Harmon, 1878.

Report and Remarks on a Fourth and a Fifth Hundred of Cataract Extractions, according to Von Graefe's Method. By H. KNAPP, M.D. New York, 1877.

Suicide not Evidence of Insanity. By Hon. O. N. PALMER, of New York.

Kolpokleisis as a means of Treating Vesico-Vaginal Fistule. Is the Procedure ever Necessary? By NATHAN BOZEMAN, M.D. Philadelphia: 1877.

On Kolpokleisis and other allied Procedures as a means of Treating Vesico-Vaginal Fistule. By NATHAN BOZEMAN, M.D. Louisville, 1877.

Cholera of 1873. By W. R. SEVIER, M.D., Jonesboro, Tennessee.

On the Immunity of certain Mothers of Children Affected with Hereditary Syphilis. By JAMES NEVINS HYDE, A.M., M.D. New York, 1878.

Relations of Syphilis to the Public Health. By FREDERIC R. STURGIS, M.D., of New York. New York, 1877.

The Paralysis of Pott's Disease. By V. P. GIBNEY, M.D. Chicago, 1878.

The Medical Expert. By W. J. CONKLIN, M.D., of Dayton, Ohio. Columbus, 1878.

Is Modern Education Exerting an Evil Influence upon the Eyesight of our Children? By A. W. CALHOUN, M.D. Atlanta, 1878.

"What am I?" By J. M. Bodine, M.D. Louisville, 1878.

Note on Hydrobromic Acid. By EDWARD R. SQUIBB, M.D. Brooklyn, 1878.

Fees of Experts. By T. M. STEVENS, M.D., of Indianapolis, Ind.

Tumour of Male Breast and Cyst of Neck. By J. H. POOLEY, M.D. Columbus, 1878.

Dangers from Colour-Blindness in Railroad Employés and Pilots. By B. JOY JEFFRIES, M.D. Boston, 1878.

Old Age; its Diseases and its Hygiene. By L. P. YANDELL, M.D. Louisville, 1878.

The Intra-venous Injection of Milk as a Substitute for the Transfusion of Blood. Laparo-Electrolysis, a substitute for the Cæsarean Section. By T. GAILLARD THOMAS, M.D. New York, 1878.

A Clinical Contribution to the Study of Post-Paralytic Chorea. A Contribution to the Study of Localized Cerebral Lesions. A Contribution to the Therapeutics of Migraine. By E. C. SEGUIN, J. C. SHAW, and A. VAN DERVEER. Chicago, 1878.

A Contribution to the Pathological Anatomy of Disseminated Cerebro-Spinal Sclerosis. By Drs. E. C. SEGUIN, J. C. SHAW, and A. VAN DERVEER. Chicago, 1878.

Faulty Innervation as a Factor in Skin Diseases. Auto-Inoculation of Vegetable Parasites of the Skin. By EDWARD WIGGLESWORTH, M.D. New York, 1878.

Objections to the Use of Carbolic Acid in the Treatment of Piles. By J. M. MATHEWS, M.D. Louisville, 1878.

A Review on the Treatment of Fracture of the Femur. By EDWARD BORCK, M.D. St. Louis, 1878.

Scarlatina in Chicago. The Etiology of Intemperance. By CHAS. W. EARLE, M.D. Chicago.

Lithotomy. By DAVID PRINCE, M.D.

On the Relation of Moisture in Air to Health and Comfort. By ROBT. BRIGGS, C. E.

Amputation of Cervix Uteri. Clinical Gynæcology, Sterility, and its Treatment. By W. H. WATSEN, M.D. Louisville, 1878.

Subperiosteal Excision of the Entire Scapula and Head of the Humerus. Recovery. By CHARLES B. BRIGHAM. Cambridge, 1878.

Fluid Extracts by Reperculation. By EDWARD R. SQUIBB, M.D. Philadelphia, 1878.

Metric Weights and Measures for Medical and Pharmaceutical Purposes. Wash. 1878.

An Address Commemorative of Nathan R. Smith, M.D. By S. C. CHEW, M.D. Baltimore, 1878.

Dislocation of Shoulder-Joint caused by Muscular Spasm. Dislocation of Femur on Dorsum Ilii Reduced by Manipulation. By A. B. COOK, M.D. Louisville, 1878.

Proceedings of the Medical Society of Delaware, June, 1877.

Proceedings of the Louisiana State Medical Association, 1878.

Transactions of the American Dermatological Association, 1877. New York, 1878.

Transactions of the Vermont Medical Society, 1877. St. Albans, 1878.
 Proceedings of the Therapeutical Society of New York. Fascic. 1, 2.
 Proceedings of the Medical Society of the County of Kings, April, May, June, 1878.
 Proceedings of Academy of Natural Sciences of Philadelphia, Sept. to Dec. 1877.
 Report of the Massachusetts General Hospital, 1877. Boston, 1878.
 Report of the Brooklyn Eye and Ear Hospital, 1878.
 Report of the Wills Eye Hospital, 1877. Philadelphia, 1878.
 Report of New York Hospital and Bloomingdale Asylum for 1877. New York, 1878.
 Report of New York Society for Relief of Ruptured and Crippled. New York, 1878.
 Report of St. Michael's Hospital. Newark, 1878.
 Report of the State Asylum for Insane Criminals. Auburn, N. Y., 1878.
 Report of the Retreat for the Insane at Hartford, Conn., 1878.
 Report of the Dayton Hospital for the Insane. Columbus, 1878.
 Report of Brigham Hall, 1877. Canandaigua, 1878.
 Report of the State Lunatic Asylum, Utica, N. Y., 1877. Utica, 1878.
 Nova Scotia Hospital for the Insane. Report for 1877.
 Report of the Connecticut Hospital for the Insane. Middletown, 1878.
 Report of Asylum for Relief of Persons Deprived of Use of their Reason. Phila., 1878.
 Report of the State Board of Health of Massachusetts, Jan. 1878. Boston, 1878.
 Report of the Board of Health of the City of Dayton. Dayton, 1878.
 Report of the Board of Health of the City of Pittsburg, 1877. Pittsburg, 1878.
 Sixth Annual Report of the Secretary of the State of Michigan, relating to the Registry and Return of Births, Marriages, and Deaths, for the year 1872. Lansing, 1877.

The following Journals have been received in exchange:—

Deutsches Archiv für Klinische Medicin. Bd. XX., Heft 5, 6. Bd. XXI., Heft 1 to 4.
 Archiv der Heilkunde. Bd. XIX., Heft 1, 2, 3.
 Centralblatt für die Medicinischen Wissenschaften. Nos. 49, 1877, to 22, 1878.
 Allgemeine Wiener Medicinische Zeitung. Nos. 50, 1877, and 1 to 22, 1878.
 Deutsche Medicinische Wochenschrift. Nos. 49 to 52, 1877, and 1 to 22, 1878.
 Upsala Läkareförenings Förhandlingar. Bd. XIII., Nos. 2, 3, 4.
 Bibliothek for Læger. Bind VIII., 1, 2.
 Nordiskt Medicinskt Archiv. Bd. IX., Fjärde Häftet, Bd. X., Första Häftet.
 Annali Universali di Medicina e Chirurgia. Dec. 1877, to Maggio, 1878.
 Giornale Italiano delle Malattie Veneree e della Pelle. Dec. 1877, to Aprile, 1878.
 Commentario Clinico di Pisa. Nov., Dec. 1877, Gen., Feb., Marzo, Aprile, 1878.
 L'Imparziale. Nos. 23, 24, 1877, 1 to 10, 1878.
 Lo Sperimentale. Fascic. 12, 1877, 1 to 5, 1878.
 La Medicina Contemporanea Nuova Rivista Italiana e Straniera. Feb. to Mazzio, 1878.
 O Correio Medico de Lisboa. Nos. 21, 1877, 2, 3, 4, 6, 1878.
 Revista d'Aero e Climatoterapia. Gennaio, Febbrajo, Marzo, 1878.
 Cronica Medico-Quirurgica de la Habana. Nos. 1, 2, 3, 1878.
 La Gaceta Científica de Venezuela. Nos. 12, 13, 1877, 1 to 19, 1878.
 Archives Générales de Médecine. Féb. to Juin, 1878.
 Revue des Sciences Médicales en France et de l'Etranger. Jan., Avril, 1878.
 Revue Mensuelle de Médecine et de Chirurgie. Dec. 1877, to Mai, 1878.
 Annales de Dermatologie et de Syphiligraphie. T. VIII., No. 6; T. IX., Nos. 1, 2, 3.
 Annales des Maladies de l'Oreille et du Larynx. Dec. 1877, Mars, Mai, 1878.
 Gazette Hebdomadaire de Médecine et de Chirurgie. Nos. 1 to 23, 1878.
 L'Union Médicale. Nos. 145 to 151, 1877, and 1 to 66, 1878.
 Le Progrès Médical. Nos. 50 to 52, 1877, and 1 to 22, 1878.
 Le Mouvement Médical. Nos. 49 to 52, 1877, and 1 to 20, 1878.
 L'Année Médicale. Nos. 1 to 6, 1878.
 Revue Scientifique de la France et de l'Etranger. Nos. 24 to 49, 1878.
 Union Médicale et Scientifique du Nord-Est. Oct. 1877, Jan. to Mai, 1878.
 Revue Internationale des Sciences. Nos. 1 to 22, 1878.
 The Retrospect of Medicine. July to Dec. 1877.
 The Lancet. Jan. to June, 1878.
 The Medical Times and Gazette. Jan. to June, 1878.
 The British Medical Journal. Jan. to June, 1878.
 The Medical Examiner. Jan. to June, 1878.
 The London Medical Record. Jan. to May, 1878.
 The Sanitary Record. Jan. to June, 1878.
 The Practitioner. Nov., Dec. 1877, Jan. to May, 1878.
 The Obstetrical Journal of Great Britain. Jan. to June, 1878.
 The London Ophthalmic Hospital Reports. Dec. 1877.
 The Journal of Anatomy and Physiology. Jan. 1878.
 The Journal of Psychological Medicine Vol. IV., Pt. 1.
 Brain: A Journal of Neurology. April, 1878.
 Edinburgh Medical Journal. Nov., Dec. 1877, Jan. to May, 1878.
 The Glasgow Medical Journal. Oct. 1877, Jan., Feb., March, May, June, 1878.

The Dublin Journal of Medical Science. Nov., Dec. 1877, Jan. to May, 1878.
 The Doctor. Jan. to June, 1878.
 The Indian Medical Gazette. Dec. 1877, Jan. 1878.
 The Australian Medical Journal. June to Sept. 1878.
 The Australian Practitioner. Jan. 1878.
 Canada Medical and Surgical Journal. Jan. to May, 1878.
 The Canada Medical Record. Dec. 1877, to April, 1878.
 The Canadian Journal of Medical Science. Jan. to June, 1878.
 The Canada Lancet. Jan. to June, 1878.
 L'Union Médicale du Canada. Jan. to Juin, 1878.
 The Boston Medical and Surgical Journal. Jan. to June, 1878.
 The New York Medical Journal. Jan. to June, 1878.
 The Medical Record. Jan. to June, 1878.
 The American Journal of Insanity. Jan., April, 1878.
 The American Journal of Obstetrics. Jan., April, 1878.
 Archives of Dermatology. Jan., April, 1878.
 The Hospital Gazette. Jan. to June, 1878.
 Buffalo Medical Journal. Jan. to June, 1878.
 Monthly Abstract of Medical Science. Jan. to June, 1878.
 Medical News and Library. Jan. to June, 1878.
 Philadelphia Medical Times. Jan. to June, 1878.
 Medical and Surgical Reporter. Jan. to June, 1878.
 Half-Yearly Compendium of Medical Science. Jan. 1878.
 Cincinnati Lancet and Observer. Jan. to June, 1878.
 Cincinnati Medical News. Jan. to June, 1878.
 The Clinic. Jan. to June, 1878.
 The Ohio Medical and Surgical Journal. Feb., April, 1878.
 Ohio Medical Recorder. Jan. to May, 1878.
 The American Practitioner. Jan. to June, 1878.
 The Chicago Medical Journal. Jan. to June, 1878.
 The Journal of Nervous and Mental Diseases. Jan., April, 1878.
 Detroit Lancet. Jan. to June, 1878.
 Michigan Medical News. Jan. to June, 1878.
 St. Louis Medical and Surgical Journal. Jan. to June, 1878.
 Saint Louis Clinical Record. Jan. to June, 1878.
 Toledo Medical and Surgical Journal. Jan. to May, 1878.
 Pacific Medical and Surgical Journal. Jan. to June, 1878.
 Western Lancet. March, April, May, 1878.
 Maryland Medical Journal. Jan. to June, 1878.
 Virginia Medical Monthly. Jan. to June, 1878.
 North Carolina Medical Journal. Jan. to April, 1878.
 Southern Medical Record. Jan. to April, 1878.
 Atlanta Medical and Surgical Journal. Jan. to May, 1878.
 New Orleans Medical and Surgical Journal. Jan. to June, 1878.
 Richmond and Louisville Medical Journal. Feb. to May, 1878.
 The Louisville Medical News. Jan. to June, 1878.
 The American Medical Weekly. Jan. to June, 1878.
 Nashville Journal of Medicine and Surgery. Jan. to May, 1878.
 The Quarterly Journal of Inebriety. March, June, 1878.
 The Sanitarian. Jan. to June, 1878.
 American Journal of Pharmacy. Jan. to June, 1878.
 Druggists' Circular. Jan. to June, 1878.
 The Pharmacist. Jan. to May, 1878.
 Dental Cosmos. Jan. to June, 1878.
 American Journal of Dental Science. Jan. to June, 1878.
 American Journal of Science and Arts. Jan. to June, 1878.
 The Journal of the Franklin Institute. Jan. to June, 1878.
 Boston Journal of Chemistry. Jan. to June, 1878.

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1. Practical Essays on Medical Education and the Medical Profession in the United States. By Daniel Drake, M.D., Cincinnati, 1832. 8vo.
 2. Lectures on Medical Education. By Samuel Chew, M.D., Philadelphia, 1864. 8vo.
 3. Contributions to the History of Medical Education and Medical Institutions in the United States of America, 1776-1876. By N. S. Davis, A.M., M.D., Washington, 1877. 8vo.
 4. Higher Medical Education, the True Interest of the Public and the Profession. An Address Introductory to the 112th Course of Lectures in the Medical Department of the University of Pennsylvania. By William Pepper, A.M., M.D. Philadelphia: J. B. Lippincott & Co., 1877. 8vo.
 5. De l'organisation des Facultés de Médecine en Allemagne. Par le docteur Jaccoud, Paris, 1864. 8vo.
 6. Les hautes études pratiquées dans les Universités Allemandes. Par Adolphe Wurtz, Paris, 1870. 4to.
 7. Etude sur l'organisation de la Médecine en France et à l'étranger. Par Leon Le Fort, Paris, 1874. 8vo.
 8. Ueber das Lehren und Lernen die Medicinischen Wissenschaften an den Universitäten der Deutschen Nation. Von Dr. Th. Billroth, Wien, 1876. 8vo.
 9. L'enseignement de la Médecine en Allemagne. Par Louis Fiaux, Paris, 1877. 8vo.
 10. De la situation de l'enseignement Médical en France. Par Chauffard, Rev. des Deux Mondes, Jan. 1, 1878.
 11. Medical Politics; being the Essay to which was awarded the first Carmichael Prize, 1873. By Isaac Ashe, M.D. (etc.), Dublin, 1875. 8vo.
 12. Report of Proceedings of the Meeting of the General Medical Council in 1877. Med. Times and Gaz., May and June, 1877. 174
- XIX. The Retinal Red and its Relation to the Sensation of Sight. Zur Anatomie und Physiologie der Retina. Von F. Boll. Berliner Acad. Monatsberichten, 1876. S. A. 5 Stn.
- Zur Photochemie der Netzhaut. Von W. Kühne. Über den Sehpurpur. Von W. Kühne. Ergänzungsheft zu den Verhandlungen des Naturhistorisch-medicinischen Vereins zu Heidelberg. B. 1, H. 1, 1877.

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Nachträgliche Zusätze zu dieser Mittheilung. Ebendas., 15 Feb. 3 Stn.	
Der Scleritis beobachtet im Auge eines gehenkten Menschen. Von Prof. Sehne und Dr. Zuckermandl. Allgemeine Wien. Zeitschrift, N. 11, 1877.	
Zur Farbe der Netzhaut. Von E. Fuchs. Wien. Med. Woch. N. 11, 1877.	
Ueber die Verbreitung des Scleritis im Menschlichen Auge. Von W. Kühne. Weitere Beobachtungen über den Scleritis des Menschen. Von W. Kühne. Das Sehen ohne Scleritis. Von W. Kühne. Untersuchungen über den Scleritis. Von A. Ewald und W. Kühne. Ergänzungsheft z. d. Verhand. des Nat.-Hist.-Med. Vereins zu Heidelberg, B. 1, H. 2, 1877.	
Ophthalmoscopische Mittheilungen über den Purpur der Retina. Von Dr. Helfreich. Centralblatt f. Medic. Wissen. N. 7, 1877.	
Untersuchungen über die Wahrnehmbarkeit des Scleritis mit dem Ophthalmoskope. Von Dr. M. J. Dietl und Dr. Ferd. Plenck. Centralblatt für die Med. Wissen., 16, 1877.	
Ueber die Diagnose des Scleritis im Leben. Von Dr. E. A. Coccius. Leipzig, 3 Juni, 1877.	
Ueber die Darstellung von Optogrammen im Froschaugen. Von W. Kühne. Untersuchungen über den Scleritis. Von A. Ewald und W. Kühne. Ergänzungsheft z. d. Verhand. des Naturhist.-Med. Vereins zu Heidelberg, B. 1, H. 3, 1877.	
Zur Anatomie und Physiologie der Retina. Von F. Boll. Arch. f. Anat. u. Physiol. Physiol. Abth., 1877. S. 4-36.	
Zur Lehre vom Lichtsinne. Von E. Hering. Wiener Sitzungsberichte, v. 66, 68, 69, 1872-1874.	
Die Macula lutea, anatomisch und ophthalmoscopisch. Von Herm. Schmidt-Rimpler. Arch. f. Ophthal., xxi. 3, p. 17, 1876.	
Études chimico-physiologiques sur les matières colorantes de la rétine. Par Stefano Capranica. Annales d'Oculistique, T. lxxviii., p. 144, 1877.	190

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

XX. Saint Bartholomew's Hospital Reports. Edited by W. O. Church, M.D., and Alfred Willett, F.R.C.S. Vol. XIII. 8vo. pp. xxiv., 354, 126. London: Smith, Elder & Co., 1877.	199
XXI. Transactions of the Obstetrical Society of London. Vol. XIX. For the year 1877. 8vo. pp. 279. London: Longmans, Green & Co., 1878.	207
XXII. On the Source of Muscular Power: Arguments and Conclusions drawn from Observations upon the Human Subject under Conditions of Rest and of Muscular Exercise. By Austin Flint, Jr., M.D., Prof. of Physiology and Physiological Anatomy in the Bellevue Hospital Medical College, New York, etc. 12mo. pp. 103. New York: D. Appleton & Co., 1878.	214
XXIII. Albrecht von Graefe: Sein Leben und Werken. Von Dr. Eduard Michaelis, Augenarzt in Berlin. Berlin: Druck und Verlag von G. Reimer. pp. 196, 1877.	216
Albrecht von Graefe: His Life and Works. By Edward Michaelis.	216
XXIV. Lectures on Medical Jurisprudence. By Francis Ogston, M.D., Professor of Medical Jurisprudence and Medical Logic in the University of Aberdeen. Edited by Francis Ogston, Junior, M.D., Assistant to the Professor of Medical Jurisprudence, and Lecturer on Practical Toxicology in the University of Aberdeen. 8vo. pp. xii., 663. Philadelphia: Lindsay & Blakiston, 1878.	222
XXV. Guérison de Six Aveugles-nés. Par M. le Dr. Louis Fialla, Chef du Service Chirurgical à l'Hôpital Philanthropie. 8vo. pp. 32. Bucarest, Thiel & Weiss, 1878.	227

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XXVI. Illustrations of Clinical Surgery. By Jonathan Hutchinson, F.R.C.S., etc. Fasciculi IX. and X. Folio, pp. 193-244. Philadelphia: Lindsay & Blakiston, 1878.	230
XXVII. Atlas of Skin Diseases. By Louis A. Duhring, M.D., Professor of Skin Diseases in the Hospital of the University of Pennsylvania. Physician to the Dispensary for Skin Diseases, Philadelphia, etc. Part III. Philadelphia: J. B. Lippincott & Co., 1878.	232
XXVIII. Injuries of the Eye, and their Medico-Legal Aspect. By Ferdinand von Arlt, M.D., Professor of Ophthalmology in the University of Vienna, Austria. Translated, with the permission of the Author, by Chas. S. Turnbull, M.D., Surgeon to Eye and Ear Department, Howard Hospital, etc. 12mo. pp. 198. Philadelphia: Claxton, Remsen & Haffelfinger, 1878.	232
XXIX. A Practical Treatise on Aural Surgery. By H. Macnaughton Jones, M.D., etc., Surgeon to the Cork Ophthalmic and Aural Hospital, etc. etc. 8vo. pp. 174. London: J. & A. Churchill, 1878.	234
XXX. Insanity in Ancient and Modern Life, with Chapters on its Prevention. By Daniel Hack Tuke, M.D., F.R.C.P. 12mo. pp. 226. London: Macmillan & Co., 1878.	236
XXXI. Montreal General Hospital: Pathological Report for the Year ending May 1, 1877. By William Osler, M.D. 8vo. pp. 97. Montreal, 1878.	238
XXXII. Mortuary Experience of the Mutual Life Insurance Company of New York, with Tabulated Reports, and an Analysis of the Causes of Death. By G. S. Winston, M.D., W. R. Gillette, M.D., and E. J. Marsh, M.D. Vol. II. 8vo. pp. 224. New York, 1877.	240
XXXIII. On the Use of Wines in Health and Disease. By Francis E. Anstie, M.D., F.R.C.P. 12mo. pp. 74. London: Macmillan & Co. 1877.	243
XXXIV. Prescription Writing, Designed for the Use of Medical Students who have never Studied Latin. By Frederic Henry Gerrish, M.D., Prof. of Materia Medica and Therapeutics in the Medical School of Maine, etc. Second edition, 16mo. pp. 51. Portland: Loring, Short & Harmon, 1878.	244
XXXV. Annual Report of the Board of Health of the City of Pittsburgh for the Year 1877. pp. 70. Pittsburgh, 1878.	244
XXXVI. Handbook of Ophthalmology. By Prof. C. Schweigger, of the University of Berlin. Translated from the third German edition. By Porter Farley, M.D., Rochester, N. Y. 8vo. pp. 555. Philadelphia: J. B. Lippincott & Co., 1878.	245
XXXVII. Transactions of the Medical Society of the State of New York for the Year 1877. 8vo. pp. 479. Albany, 1877.	245

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ARTICLE I.

ON A RARE VASO-MOTOR NEUROSIS OF THE EXTREMITIES,¹ AND ON THE
MALADIES WITH WHICH IT MAY BE CONFOUNDED. By S. WEIR MITCHELL,
M.D., of Philadelphia, Member of the National Academy of Sciences.

A FEW years ago I published in the *Philadelphia Med. Times* (1872, pp. 81 and 113) a brief paper upon certain painful affections of the feet, and drew attention to a form of foot-disorder which I was unable to find fully described elsewhere. This paper attracted little attention; and I now find myself called upon, by a larger and more fertile knowledge, to review the subject, and again to call to the notice of physicians a somewhat rare, and yet most interesting, form of disease.

I have called it a rare disease, because, in a large experience, I have seen but few cases; yet it is likely that, when once recognized, it may be found to be more common than I now conceive it to be.

In dealing with this subject, I shall first draw a picture of the malady as I have seen it in its various degrees of severity; I shall then relate cases from the mildest to the most severe; and end by discussing them from such points of view as they may suggest.

The patient, nearly always a man, after some constitutional disease, like a low fever, or after prolonged physical exertion afoot, begins to suffer with pain in the foot or feet; usually it comes in the ball of the foot, or of the great toe, or in the heel; and from these parts it extends so as to involve a large portion or all of the sole, and to reach the dorsum, and even the leg. More often it is felt finally in a limited region of one or both soles, and does not extend beyond these areas. At first it is felt only to-

¹ The foot and hand disorder I am about to describe may be conveniently labelled Erythromelalgia; ἔρυθρος, red; μέλος, a member; ἀλγος, pain.

wards night, and is eased by the night's rest ; but, soon or late, it comes nearer and nearer to the hour of rising from bed. In like manner, while at first it is made to increase only by excessive exertion afoot, by and by it comes on, whenever the upright posture is assumed, or even when the foot is allowed to hang down. Since, however, the disease is not necessarily progressive, there are instances in which the pain never passes a definite limit. One case may for years have the trouble only in the evening ; a second may reach and remain at the point where only a long walk in summer causes it ; a third may stand still, as it were, in a far more advanced stage of the malady, and, though suffering horrible pain, become no worse ; while in the gravest cases, more familiar signs of organic disease of the spinal cord may arise to shed light upon the pathology of the minor forms of the trouble.

In rare cases, the first pain is said to be an ache of the foot ; but in the mass of instances, and soon or late in nearly all, the pain is of a burning character. "It is the pain of a burn ;" "the pain of mustard ;" "of intense sun-burn ;" at least these are the phrases used to describe it, and certainly the character of the suffering is often so well marked as to be clinically distinctive. In the milder cases it may come and go, or be present daily at some time, as upon exertion, and yet be but trifling in its intensity ; while in severer cases the burning reaches the extreme of torture. The sufferer, when placed on his feet, rocks as if unsteady ; and if his eyes be closed, may deceive the observer into the belief that he has before him a case of locomotor ataxia. Yet a vigorous effort of will is fully competent to preserve the balance ; and this unstable equilibrium is not seen until, owing to the upright posture having been preserved for some minutes, the pain has risen to a maximum of anguish.

In the later stages of the disease the pain is throbbing, aching, and burning, owing, I suppose, to the vasal disorders, which are seen in some cases throughout, and always in the graver examples.

In every case, and at all stages, the pain is relieved or arrested by the horizontal position, and by cold. It is brought on and made worse by standing or walking ; and, in bad cases, by allowing the feet to hang down ; while warmth, and, of course, heavy feet-covers, act in like manner. Summer is usually, not always, the season of greatest annoyance ; winter a time of comparative ease. The sufferer sleeps with uncovered feet, and goes about without stockings in his house ; and finds, even in winter, a light slipper or a low shoe comfortable.

The next striking peculiarity of this disorder is the flushing of the part upon exertion. This symptom, which is usually absent in the very early stages, is a notable feature of the worst of the prolonged cases, and in some mild instances can always be brought on by great exertion afoot. In the graver examples, the area of greatest pain in the soles or hands is distinctly and permanently marked by a dull, dusky, mottled redness, as if

the smaller vessels were always over-distended. In these and in some of the less severe cases, the region of pain is in places tender, and firm pressure by the finger or hand will bring on increased pain, and even cause the whole foot or hand, or a part of it, to become red, just as it does when the man stands up.

The pain in these cases is also entirely inhibitory of walking, and if this action be persisted in, gives rise to intense redness, swelling from dilatation of vessels, and finally to blistering of the soles.

Where flushing is a part of the phenomena of this interesting malady, it comes on during the erect position slowly in milder cases, and almost at once in others, and involves both veins and arteries. The foot gets redder and redder, the veins stand out in a few moments as if a ligature had been tied around the limb, and the arteries throb violently for a time, until at length the extremity becomes of a dark-purplish tint.

In the worst cases, when the patient is at rest, the limbs are cold, and even pale. The flushing, which, at first, seems to be an active condition, accompanied with rise of temperature, in a few minutes becomes passive; that is, the arteries cease to throb, the heat lessens, and there is evidence of lessened oxidation.

The less severe examples manage to get along by rest at intervals, but the worst cases are unable to stand for more than a moment, and the sufferer crawls on his hands and knees, keeping his feet off the floor, or is obliged to be carried about.

I have seen lately two examples in which the disease seemed to have been progressive, and to have been associated in the later stages with distinctive evidences of spinal disease, such as atrophic states, the pain-belt (*douleur en ceinture*), partial losses of power, and other phenomena, which vary in the two cases alluded to. Also in one of them all the singular features which in the early stages were seen in the feet, were at a later stage exhibited in equal fulness in the hands, or rather in the hand, since one had been lost by amputation.

One other peculiarity is common to all of them. They are rarely amenable to treatment. They are aided for a time by cold and by rest; but either they remain unchanged for years, or else in rare instances become gradually worse.

As to diagnosis, I am aware of no other malady with which the bad cases of this trouble can be confounded; but there are certain other more or less painful affections of the feet, with which the lighter forms might be confused; and I shall, therefore, make some brief allusions, at the close of these pages, to the maladies of the feet, from which it is needful to distinguish the disease I am describing.

CASE I. The patient, a sailor, aged about forty, while in the United States naval service on the coast of Africa, suffered from sunstroke. This was followed after a few months by a grave attack of coast-fever, and from

this seemed to date an enfeebled condition of the heart, with an apex murmur heard during the systole. He reached the Norfolk Hospital eight months after his fever, and was there during the whole winter. Some time early in the next year he began to have dull, heavy pains, at first in the left, and soon after in the right foot; the pain was a dull ache, and seemed to be in the interior of the foot, between the sole and the instep. At first, and indeed for three months, the pain was unaccompanied by swelling, but in April this new symptom was observed, after much exercise, and then only.

The disease progressed rapidly, and when I saw the man, in June, his condition was no less strange than pitiable. He was a well-made, vigorous person, of rather ruddy complexion. His appetite and digestion were good, his bowels regular, and his urine, save some slight though constant deposit of urates, in all respects normal. He told me that he had pain in the feet whenever he attempted to walk, but that while at rest in bed he was perfectly comfortable. The case, as he spoke of it, was to me so novel that I somewhat mistrusted his statement, and, therefore, directed him to walk up and down the ward and about the grounds until I sent for him, which I did when at the close of an hour my visit was over. He made his appearance in the ward, walking with the step of a man whose feet were tender. On examining his extremities I found them both swollen. They scarcely pitted on pressure, but were purple with congestion; the veins were everywhere singularly enlarged, and the arteries were throbbing visibly. The whole foot was said to be aching and burning, but above the ankles there was neither swelling, pain, nor flushing. On other occasions I examined him in bed, and then caused him to stand for a time. Almost at once, without previous pallor, the feet began to fill with blood, and after a quarter of an hour or less, if he walked, the pain appeared, and with it the swelling so increased as after a time to force him to lie down. He was very sure that he had suffered pain long before either swelling or redness was observed, and I am disposed to think this statement correct. As the autumn came on and the weather grew cold, I was able to verify another of his statements, to the effect that cold relieved him and that heat increased his sufferings. In fact, he preferred to wear slippers without stockings, and while on cool days he could walk for an hour before his pain became great, in warm weather a few minutes of exertion were enough to bring about this result. A hot foot-bath had a like effect, and cold bathing was almost the sole means of speedy relief. A long series of therapeutic experiments failed to afford him any permanent ease. The local use of cold, and of alternate heat and cold, bandages, sedative washes, lead-water and laudanum, leeching and blisters, digitalis, arsenic, and tonics, all alike failed to help him, so that at last, having gained something from the cold of early winter, he left us, and I have never heard of the issue of his most singular history.

CASE II.—G. K., æt. 35, single, clerk, American. The patient lost his right arm during the war, in the year 1862, and since that time he has been gradually losing strength. He was not subjected to hard marching when a soldier, and he denies all venereal taint.

The indirect cause of his indisposition, he thinks, was "army life," and the direct cause "prolonged continence."

In 1864 he had an attack of "typhoid fever," which left him with some impairment of vision, so that continued reading would bring on headache.

In 1872 he was examined ophthalmoscopically by Liebreich, who detected hypermetropia, and gave him glasses for its relief. Some time before this latter date the patient began to experience burning pain in the soles of his feet upon walking; if he persisted in the attempt after this, the feet grew red and swollen, and finally became blistered.

Walking also caused pain in the back. During cold weather he was moderately comfortable, provided he did not walk; but in warm weather his feet ached him nearly all the time, and for relief he was obliged to apply cold to the feet. In this condition he continued, without much change, until August, 1875, at which time he made a misstep, and his right ankle gave way under him, and before he recovered from the sprain a like accident befel the left ankle.

A few days later, while leaning on his hand, his wrist also gave way, and soon after this he began to experience a burning pain in the hand, particularly when pressure was made upon the palm.

Using his hand also caused violent pain, after which it became relaxed and feeble; the whole hand would then swell and the fingers in particular become red.

The pain, before mentioned, in the soles of his feet was at first limited to the part immediately below the metatarso-phalangeal articulations, but by 1876 it began to extend toward the outside of the feet, and finally appeared upon the dorsum of the right foot. Pressure over this region never caused pain, except when the patient was suffering from a more than usually severe attack. At such times the pain would shoot upwards on the outside of the right leg. The heels were never the seat of pain.

In November, 1876, when the foregoing notes were taken, the man's condition was as follows:—

The patient was well nourished, his appetite and digestion were good, and his bowels regular. Walking caused so much pain in the feet that he rarely attempted it, but sat all the time with his feet elevated, and so managed to keep moderately comfortable. When in bed he frequently left his feet outside of the bedclothes, in order to keep them cool. After a night's rest he suffered little, but the pain reappeared soon after he arose. More relief was obtained from cold applications than from anything else.

Standing upon his feet in a very few moments caused them to become engorged with blood and swollen. This was particularly marked along the edges of the toes. This posture caused intense burning pain in the part of the sole before mentioned, but gave rise to no pain in the back, as it did a few years before. The right foot was more severely affected than the left. No peculiarities could be observed in the stump of the lost arm, and there was no complaint of pain, either in the stump or in the lost arm or hand. Any pressure on the left palm caused great pain and local flushing, as did any attempt to grasp an object; but no paralysis of the muscles of the arm or hand could be detected. He was able to push with his hand extended without suffering pain. There was also excessive sweating of the hand. The growth of the nails did not seem to be at all affected, and this was true also of the toe-nails. There were no cerebral symptoms other than the headache after reading. There was no tenderness over the spine, and examination of the heart, lungs, and urine gave merely negative results. The patient rarely had seminal emissions, in fact only about three a year. The application of the constant current to the feet where red, caused a whitening of the part, which lasted longer than the

whitening produced by simple pressure. Massage was ordered, and at first this seemed to relieve him, but the improvement was transient.

He was ordered heat to the spine, galvanism to the feet, and digitalis and tincture of iron internally. After this the patient was lost sight of until January 31st, 1878, when the remainder of these notes were taken. He was at that time a patient at the Elmira Water Cure, New York. The following notes, although meagre, were obtained with much difficulty, owing to his condition, and to the fact that his attendants knew but little, if anything, of his history, either before or after his entrance into the institution:—

Patient entered the institution in July, 1877, and appears at that time to have been able to walk a few steps with the aid of a crutch; but this would almost immediately bring on an intense pain in the soles of his feet, in his back, and in his hand. To lessen the latter pain as much as possible, he held the crutch gripped tightly between his arm and side, and used his hand as little as possible.

His right arm having been amputated near the shoulder-joint made progression very difficult, especially as the erect posture also brought on pain in his head, and sudden attacks of vertigo.

In walking he was noticed to drag his right leg a little, but no other paralysis was observed. In November his disposition began to change, and, instead of being desirous of company and conversation, he became morose and fond of solitude. His power of conversation also left him, and he would only answer in monosyllables. Since then he has been confined to bed. Since July he has had seven convulsions. In these he became rigid, was but slightly convulsed, and did not foam at the mouth, or bite his tongue. The attacks seemed to be bilateral. For several days after these seizures the patient would be drowsy, and during these periods squinting would be occasionally noticed.

He lies in bed, face downward, and a little upon his right side. This position is retained nearly all the time, as any other causes pain in the dorsal region, and in his thighs in the line of the sciatic nerves. The weight of the bedclothes is so distressing to him that a hoop is needed to keep them from touching his back. He is well nourished, his appetite is fair, and his tongue clean. He is, however, generally slightly constipated.

His skin is dry and cool, and there is a branny desquamation of the cuticle. His conjunctivæ are congested. He, however, states that his vision is unimpaired, although he wears powerful convex glasses; there is no nystagmus; his pupils are large, equal, and react readily to light. He states that his mouth is occasionally drawn to the right side, although at the time of taking these notes it appears a little drawn to the left. His tongue is protruded in a straight line, and without trembling.

His speech is hesitating, whispering, and very slow. All questions are answered with evident reluctance, and in monosyllables. He, however, answers rationally, but the attempt apparently causes great effort and soon exhausts him. He hardly ever sleeps.

There is marked œdema of the body and lower extremities, and these parts pit upon pressure. Any pressure over the dorsal or lumbar region of the spine, on the outer part of the thighs and on the feet, causes great pain. Pain is also caused by pressure over the scalp, back of the neck, on the shoulders, on the hand, and on the forearm up to the elbow, but none is caused by pressure on the upper arm. There is occasional spontaneous pain in the stump of the arm, but nothing peculiar can be detected on inspection.

His hand is extremely cold, and the finger ends are darkly cyanosed. The fingers from the second row of joints to the tips are very shiny, and the nails grow. He is utterly unable to grasp anything in his hand.

There is spontaneous pain in the soles of the feet, particularly when they are at all warm, and pressure causes pain when made on the soles or on dorsum of the feet, but not on the toes. There is slight vesication on the outer side of the left foot and ankle, but this is not the seat of especial pain.

To the hand the feet feel cool, and alike as regards temperature, but a surface thermometer held in contact with the feet for some time fails to register 70° F., the lowest graduation on the scale. Under the tongue the temperature is $99\frac{1}{2}^{\circ}$ F.

From the painful region in the back there is radiating pain around the body, and the patient states that the sensation is that of a "tape tied around" him. Cold applications to the back relieve this pain considerably, and in order that he may remain as comfortable as possible the temperature of the room is kept very low.

Sensation appears to be well preserved in the feet, and impressions are properly located; the difference between heat and cold is also appreciated. The whole body except the head is the seat of a fine tremor, which is much increased by voluntary motion. The muscles can be moved at will, but the effort caused rapid exhaustion. The right leg appears to be a little more feeble than the left.

Electro-muscular contractility to the induced current in the arm is apparently normal; but no reaction is caused in the legs to the same current; a stronger one causes a general spasm of the lower extremities.

The patient never has seminal emissions, or priapism. There is occasional palpitation of heart. Examination reveals feebleness of heart's action, and a slight systolic murmur heard best towards apex. The pulse is 100 per minute. Examination of lungs gives negative result. Ophthalmoscopic examination reveals slight enlargement of veins and irregularity of form of disk, but no choking in left eye. The right disk appears whiter than normal. This examination, being made with great difficulty, is therefore not positive.

The urine is passed freely and in normal amount, it is pale, very slightly acid, and upon standing deposits a light, flocculent sediment, which, however, clears upon boiling.

There is no albumen either upon boiling or upon the application of Heller's test, and no casts could be detected by the microscope.

CASE III.—J. P. S., æt. 58, born in Philadelphia, formerly a worker in iron. The patient's family history is unexceptionably good, his ancestors living to a good old age, and there is no history of hereditary disease. With the exception of an attack of dysentery twenty-five years ago, the patient has enjoyed good health until the beginning of his present indisposition. He is a temperate man, and denies all venereal taint. Thirty-three years ago he married; he has had eight children, all of whom are alive and healthy; the youngest having been born seventeen years ago. He has been a hard worker, and his business required great muscular exercise, as he had to use the sledge-hammer; as a consequence he was compelled to stand nearly all the time. For many years he has ceased to do manual labour.

In June, 1873, he noticed "a burning sensation" in the extreme end of both great toes; this came on towards the close of a hard day's work,

but soon disappeared after retiring. Upon inspection nothing was to be seen; but the tissues seemed somewhat indurated at the extremity of the toes, and pressure at these points caused pain. Ordinary handling of the foot gave rise to no pain whatever. These conditions lasted without change for six weeks, and then disappeared.

In February, 1876, owing apparently to excessive exertion at the Centennial Exhibition, and after entire freedom from pain since 1873, he again began to experience pain in his great toes; the right one being the most painful. Two weeks later, the pain spread from the right toe across the sole beneath the metatarso-phalangeal articulations to the right side of the foot; any pressure upon this part was very painful, and standing with his shoes on became almost unbearable. The left toe in the mean time caused but little annoyance. Rest in bed, as before, removed all pain. No change worthy of note occurred until the December following, when the pain in the right foot became much more severe, and he then noticed for the first time redness of right foot, swelling of the veins, and slight œdema of toe; this latter symptom was also present, but to a less degree, in the left toe.

By April, 1877, the pain had invaded the right heel, leaving the inner part of the hollow of the foot entirely free. He was now obliged to elevate his foot in order to obtain any comfort. He describes the pain as being of an intense burning character, resembling the pain that would be caused by "holding the foot very near a red hot stove." Shortly after this he began to notice spots of discoloration, each about the size of a pea, particularly towards the anterior part of the right sole, where the pain was most intense; by June these spots were to be found on the right heel, and a little later, they appeared simultaneously with the pain upon the outer part of the dorsum of the foot.

In the early part of the summer he began to complain of vertigo, flushing of the face, injection of the conjunctivæ and tinnitus aurium; the latter symptom being very annoying, and resembling a steam whistle. In addition to these symptoms he began to suffer from amnesia; he had great difficulty in selecting the proper words to express his thoughts, would make many blunders, and would be aware of them as soon as made. There was also some loss of control over the movements of the tongue. The amnesia lasted but one week, while the other symptoms continued for about two months.

Shortly after the amnesia (in the latter part of July) he had paresis of the right arm and leg; this lasted one week, was not accompanied by pain or formication, and the patient does not remember any accompanying facial palsy, nor was there any loss of control over the sphincters.

In August he had a violent attack of dysentery, while at Atlantic City, where he had gone to recuperate. This attack lasted three weeks, and during that time he was entirely free from pain in the feet.

In October the pain became worse at night. He then had the induced current applied, by an electropath, every day for six weeks, for two hours a day; the poles being passed all over the body. At first this gave him relief for about three or four hours each night; but at the end of five weeks' treatment the pain, which previous to this time had been confined to the left toe, began to spread across the sole beneath the metatarso-phalangeal articulation with the little toe, and it then became terribly severe. When he wished to move about his room, he was now compelled to do so on his hands and knees, whereas before he was able to get about with the aid of a crutch and cane.

By the 7th of December an aching pain, like that of a cold, became general over his whole body, and remained for ten days. About this time he began to notice slight loss of control over his bladder.

Cod-liver oil and daily massage were now ordered, and almost immediately the pain began to diminish, and in three days it had entirely left the left foot.

One application of the constant current (fourteen cells descending current) on December 31st caused little if any sensation at the time, but in a few hours the pain became much more severe, and extended up the right leg to the hip; it also returned to the left foot. This exacerbation lasted three days; the pain then entirely left the left foot, and since that time he has been gradually improving. At different times there has been slight jerking of the right leg, particularly when the pain has been severe.

Fig. 1.



Fig. 2.



Area of pain in right foot, June to December, 1877.

I first saw this man in December, 1877, in consultation with Prof. Wm. H. Pancoast. His condition at the time was as follows: Patient is a spare man, but is fairly nourished, his appetite is fair, and his bowels perfectly regular. Pain exists in the feet over the areas delineated (see diagrams), particularly when the foot is dependent; pressure causes great pain over this region, and standing upon the foot is almost insupportable.

Inspection shows slight redness of the right foot, and a few dark spots, about the fourth of an inch in diameter each, situated mostly towards the anterior part of the sole. There is also dwindling of the right leg.

The left ankle, calf, and thigh at middle third measure respectively 7, 11, and $16\frac{1}{2}$ inches; while at the corresponding points the right leg measures $6\frac{1}{2}$, $9\frac{3}{4}$, and $15\frac{1}{4}$ inches only, and there is distinct appearance of atrophy with remarkable flabbiness of the muscles. Lowering the right foot almost instantly causes very marked distension of the superficial veins, and intense flushing of the skin, and this procedure, as before mentioned, gives rise to acute pain. The temperature of the right foot is decidedly higher than that of the left.

Sensation is normal over the left foot, but there appears to be some hyperæsthesia, even to light touches over the right sole, an "indescribable

sensation" being caused by touching the discoloured spots with a sharp point. The sensation over the rest of the foot and leg appears normal. Appreciation of warmth and cold seems perfect in both feet.

The electro-muscular contractility appears normal in the left leg and foot, while in the right it appears to be distinctly increased despite the wasting. There is no facial palsy, and the tongue is protruded in a straight line. The grip of the right hand is strong, a little more so than the left; there is no apparent wasting, and the sensation is good. There is no pain in any spinal region, and the patient is able to stand perfectly steady with his

Fig. 3.



Area of pain in left foot, Oct. 1877.

eyes closed for a short time, but then unsteadiness is caused by the intense pain.

I saw this patient about two weeks later, and found him in bed, with the bed-clothes lifted off his feet by the aid of a cage of half hoops. The congested look of the pain areas in the sole was remarkable. They looked like severe frost-bites. The sudden increase of pain and filling of the vessels on his assuming the erect posture were as notable as ever, and the rapid whitening, when the legs were lifted, seemed to me no less interesting. Pressure on the right sciatic nerve suddenly increases the sense of burning. As he was notably thin and pale, it was agreed that he should continue to take dialyzed iron and cod oil, and that massage should be used daily, as before, on the feet and legs. He was also dry-cupped over the spine.

The amendment under this treatment was almost sudden, and has continued. To-day, Feb. 17, 1878, he came to see me, and said he was better than he had been for a year. It is to be remembered, however, that he has once before improved, and again relapsed. He tells me that the wasted right leg is enlarging, and certainly his gain in flesh and colour was satisfactory.

Dr. Morris J. Lewis, to whose care I am indebted for the notes of this case, endeavoured, on Feb. 16, to study his temperatures; unfortunately for this purpose he was already better. However, I give the result. Dr. Lewis says: "I held the thermometer carefully in position, each time I made an observation, for over fifteen minutes. When the patient was on his back in bed the temperature of the right sole was $96\frac{4}{5}^{\circ}$, the left sole was cold and clammy, and would not register 93° , the lowest degree on the thermometer; it was held in position twenty minutes. When the right foot was on the floor the mercury rose only to $95\frac{1}{2}^{\circ}$, and then began to fall again, and the foot began to lose some of the congestion, which came on immediately after placing it on the floor.

"On the dorsum of the right foot when dependent the mercury stood at $95\frac{4}{5}^{\circ}$. The left foot was still too cold for my thermometer to register."

The group of cases which I have just described seem to me to be closely related, and to differ chiefly in degree, and in the fact that one of them was arrested in its pathological progress; whether or not I am correct in suspecting that they may represent stages of one malady can only be deter-

mined by future research ; but, with this word of caution and reserve, there can be no harm in calling attention to them as members of one genus.

I believe that the group of cases described, together with some of those which I shall now add, represent an unrecognized type of spinal or cerebro-spinal disorder, and that they may be found in the future to be associated with distinct lesions of definite regions. The mere fact of pain, with vaso-motor disturbances, does not, I think, as yet authorize me to attempt to localize the malady, and I prefer to resist the temptation to speculate in this direction without sufficient grounds.

The gravest case of the series has a good deal the aspect of a sclerotic affection ; but, as to the others, this would seem less probable if they stood alone.

In all of the examples the pain seems to have preceded the vaso-motor phenomena, so that we must look upon the latter either as caused by the implication of vaso-motor centres, or as due to a reflex affection caused by the pain or by the disorder of the central organs, disease of which gave rise to pain. It is to be noted that in these cases pain came before flushing was habitual, and that afterwards it always arose whenever the part was so situated as to give rise to flushing ; while in Sir James Paget's case, which I shall presently relate, the pain was coincident with intense pallor of the limbs.

The following case is remarkable, because of being confined to the hands, and because of its irregular intermittent nature :—

CASE IV.—Mr. S., æt. 29, merchant. Had syphilis with slight secondary symptoms in 1867 ; was treated with mercury and iodides, and has had no return of the troubles. His father died of tubercular disease. In 1875 he had a slight attack of rheumatic fever, but made a good and rapid recovery. Three months later he noticed that in using a pen the ball of the thumb became sore, and soon after he observed a like soreness of the palm after driving some nails into a wall. Shortly after, without known cause, he was attacked with a sharp burning pain in the cushions of all of the fingers of the left hand ; this lasted but a few days. Then he had a severe attack in the right hand, on the thenar eminence, and from this time the pain was rarely absent for a day.

He consulted me a few months afterwards, when I found him in the following state : He was ruddy and well nourished, had no dyspepsia and no disorder of any viscus. Both hands were suffering from acute burning pain, which affected limited regions, and varied in its place and in severity. When I first saw him the finger ends were darkly congested, and over the thenar and hypothenar eminences of the left hand and on the latter part only in the right hand were distinctly limited patches of dusky redness, sometimes mottled. In the affected parts the pain was burning and aching in character, and was made worse by the least pressure, which was also competent to bring on pain at once or to increase it ; and when I pressed with my thumb on the palm, which was free from pain at the time, a limited well-defined area of congestion appeared, accompanied with intense burning. The nerves of the arms were not unusually sensitive, and the temperature of the burning parts was but a trifle above that of the

rest of the member. The next day he appeared again to show me that he had no pain; but he carried his arms curiously, holding the hands across his breast, and assuring me that to walk with them swinging at his side would renew the pain. When, at my request, he allowed one to hang down, it became flushed all over in a few minutes, and then grew paler until there remained several large islets of dusky redness, which only after a few minutes became painful. Next he rested his body on the other hand placed on a table. The same changes occurred at once, and the pain became intense, the finger ends especially burning and throbbing, and presenting a smooth dusky red appearance. Heat made him worse, and he looked forward to the summer with apprehension, since each return of warm weather had made him suffer, while the cold of winter had always proved grateful. Long immersion in cool, not ice-cold, water greatly eased him, and at times even put an end to his pain.

He had no headache or vertigo, but at the third cervical vertebra there was a dull pain when he made any extreme movements of the head and neck. At times he had numbness of the hands, and this was very common at night, but I could not find that the sense of touch was lessened, although of this I was not secure, because the least pressure with the compass points caused pain and congestion. With the attacks came always great increase of perspiration. Of course, this singular malady made his life one long torment, and, as an example of the annoyances to which he was subject, I may say that he was forced to immerse his hands in cold water when he wished to cut his nails. He thought that there was at times slight burning in the feet, but they showed no signs of congestion, and, as he could walk for miles in all weather, I am inclined to think that he was mistaken. After much local and general treatment, antisyphilitic and other, he was greatly eased by a succession of large blisters on his neck. He went to Europe soon after, and I lost sight of him for a long time. I have since learned that the pain lessened, but that having found that stimulants in large amount eased it, he had become an habitual drinker, and was in utterly broken health. I cannot say whether or not he retained the burning pain.

I may add that, when at his best, movement of the wrist and fingers gave rise to no pain, and that the torment seemed to be in the subcuticular tissues, and not on the surface of the skin.

It is needless to point out the close analogy between this case and those which I have reported, and in which, save in one, the pain was confined to the feet.

CASE V.—I was consulted, three years ago, as to a case somewhat similar to that of Mr. S., but have mislaid the notes of it, so that I shall content myself with stating that it followed, in this instance, a nearly mortal attack of remittent fever, and seemed directly due to the long use of a small hammer, used in breaking rocks for geological study, at least it was to this that the patient referred his disorder. In most other respects, the cases were similar, but in the latter example, the blotches were larger, and the attacks lasted for weeks at a time. There was in this case a certain stiffness of the neck, and at times slight unsteadiness, but no true vertigo, and no ear or eye symptoms. The attacks could be made worse by pressure, and could be brought on by it. The burning pain was intense, and when the attacks went off there was often for some hours a notable pallor and cold of the hands.

While this paper was passing through the press, Professor Alfred Stillé placed at my disposal the following notes of a case reported by his son, Dr. Henry L. Stillé, living at Guerrero, Mexico. It is so interesting, from the combination of livid extremities, burning pain, and trophic changes, that I regret not to have a fuller detail of symptoms.

CASE VI.—The patient is a woman 29 years old. She has a dark complexion, and is well developed and nourished. There is no history of hereditary disease; neither phthisis, scrofula, nor syphilis. There is no disease of the heart or lungs. All the natural functions are well performed, except menstruation, which is at times profuse and at others scanty, and always accompanied by severe pain.

Three years ago, while menstruating, she fell into the river; the day following the menses stopped, and did not reappear for several months. A week after the cessation, she noticed a peculiar tingling or burning on the palmar surface of both hands, from the second phalanx to the tips. This continued until it involved also the dorsal surface of the same portion of the fingers. About the time of the expected return of her menses, she had intermitting flushes of heat over the whole face except the forehead, and the extremities of the fingers were observed to be of a livid color and hyperæsthetic. These symptoms now exist, and, besides, the fingers are clubbed, the nails four or five times their natural thickness, and curving over the tips of the fingers. It seems as if the muscular and fatty portions had shrunk, and also as if the last phalanges had been absorbed. The color of the skin over the affected parts is bluish, and the want of power in the fingers makes it impossible for the woman to sew or work at all, while the tingling and burning are constant, but increased at each menstrual period, when they are also felt in the face. There is no fever nor headache, and the patient eats and sleeps well. A vaginal and uterine examination gives only negative results.

Cases precisely like those I have described must be singularly rare, but I have found a few which present enough likeness to make me willing to quote them as belonging clinically to a group which needs a larger study. In the following case there were burning pain, great congestion, some hardening of the areolar tissues, and swelling.

CASE VII.—G. P., æt. 22, baker,¹ had gonorrhœa in 1854. In 1856, he had a chancre, and in three months cutaneous secondary accidents and rheumatism. He recovered rapidly. In Oct. 1858, after excessive labour, he felt in the toes and fingers acute pains, with swelling, heat, and redness. He had a pulse of 72, and no lesions of any viscus. The heat and swelling and pain were intolerable, and were eased only in very cold water, or by exposure to a temperature a little above zero of C. Somewhat later, rare pustules formed on the hands, and the agony seems to have been excessive. Nothing is said as to pressure, or touch being painful, except that at last the upright posture became unbearable. This disease lasted about two months, when the symptoms lessened in severity, while the loss of muscular power became notable, especially in the extensors of the feet. At the same time, the sensibility of the feet became so much affected, that he could not feel the ground. The patient recovered within three months.

The case I have quoted briefly is a fair example of a few others to be found in French medical literature. They are usually described as cases

¹ Le Bordeaux Médical, Sept. 23, 1873. M. Greiner.

of sporadic acrodynia, owing to their marked resemblance to the malady which appeared as an epidemic in France, in 1828, 1829, and 1830 (*ακρα extremities—ὀδυνη—pain, acrodynia*). It has since been seen so rarely, that the few cases described, and which seem to have lacked many of the symptoms of the original disease, may really have been due to other causes than those which gave birth to it.

The epidemic belonged chiefly to the summer months, and was characterized by vomiting and diarrhœa, œdema of the limbs, redness, or dark splotches like frost-bites on the feet and hands, some thickening of the skin, intense pain, sense of heat, dysæsthesia of palms and soles. The pain existed if the congestion was absent. There were cramps, local spasms, and sometimes loss of power. Relapses were frequent, and death was very rare. The attacks lasted from a few days to two months. I have mentioned this disease merely to distinguish it from the chronic malady I have described, but the analogies are no less striking than the differences.

The cases which follow are members of the group I have already described and illustrated, but differ in being milder. Perhaps, were they more fully reported, the resemblance might be yet more striking.

Vulpian,¹ after discussing the local asphyxia of Raynaud, describes, with exasperating brevity, a case which he saw with Alph. Guérin:—

CASE VIII.—The patient, a nervous woman, 35 to 40 years old, had been tormented for more than a year by attacks of painful burning of all four members, but especially of the legs and feet. This trouble broke out nearly every day, but at no regular hour. When it began, the feet and lower part of the legs became congested, the skin grew dark-red and very warm, while the arteries of the feet, which in the interval were scarcely to be felt, beat with violence, and appeared to be dilated. There seemed to be at the same time a very painful sense of numbness, and to walk so increased the symptoms that exercise afoot became impossible. The only relief was found in cold foot-baths. Many means of relief were used, but bromides, ergot, galvanism, and a number of other remedies all alike failed to be of service. M. Vulpian adds that the congestion came on without precedent anæmia.

M. Sigerson,² whom Vulpian also quotes, has published a somewhat similar observation, in which there was feebleness of the four members, with congestion, heat, and sensitiveness of the hands. Heat made the disorder worse; cold relieved it.

The following case, which I quote somewhat in full, appears to have been a good but irregular example of the disorder, illustrated by my own cases, and is valuable because it comes from the pen of so acute an observer as Dr. Graves.³

CASE IX.—A young lady, aged 16, having had poor health for some time previously, then suppressed catamenia, followed by a severe diarrhœa, which weakened her greatly, was attacked by paroxysms of heat and tingling of the sole of the foot, then of the instep, ankle, and leg to the middle of the calf; subsiding on one side and then beginning on the other, the sensation of heat becoming

¹ L'Appareil Vaso-moteur, t. ii. p. 623.

² Progrès Medical, 1874.

³ Clin. Lect., ed. 1864, p. 826.

extreme, and the accompanying pain almost unbearable. As these symptoms increased, the vascular congestion and fullness of the limb augmented, and all the vessels became prominent. The attacks lasted eight or nine hours, leaving her with a sense of uneasiness in the limbs, and some numbness or ill-defined morbid sensations. The daily amount of ease did not exceed three hours.

The congestion of the cutaneous capillaries caused the skin to grow red, then the hue deepened; it became swollen, smooth, and shining—the colour of a black cherry when nearly ripe—and exquisitely sensitive to touch. When the hot fit ceased, these phenomena slowly disappeared, the part gradually becoming pale, deadly cold, and comparatively free from pain. Then the same phenomena appeared in the other foot and leg.

The attacks began daily at seven in the morning, and lasted until four in the following morning; during this time she was unable to sleep. She was obliged to sit or recline during the entire day, since, if she walked, the pain and heat were immediately brought on.

The catamenia had been restored after six months, and her general health seemed good, considering the almost incessant pain and loss of sleep.

All these phenomena increased in severity, so that one year later the limbs were constantly swollen, and, whether cold or hot, equally painful. Both the hot and cold stages were attended with acute pain and extreme discoloration. Applications of cold water alone gave any relief.

Three months later a tendency to palpitation came on without cause, and with it a similar feeling of pulsation in the legs. Also some constipation; easily relieved by magnesia; but the movements of the bowels so induced caused slight faintness. The urine was scanty, reddish, and muddy; the sediment, white or reddish.

Driving caused pain in the left side; headaches became frequent, and the complexion varied. The disease of the feet, however, was not accompanied by the least derangement of the general circulation, or of the state of the rest of the skin.

Three years from the commencement of the affection the intermissions lasted from 11 A. M. to 7 P. M., and more rest was secured.

“It is curious that this long-continued derangement in the circulation of her lower extremities, and the extraordinary pain the patient experienced daily for six years, have not produced any paralysis, any diminution of muscular power, thickening of the skin, induration of the subcutaneous areolar tissue, or stiffness of the joints. Considering how hot, red, and swollen a considerable portion of each limb is during many hours every day, it is quite surprising that no evident alteration of structure was the result. This fact is extremely interesting in a physiological and pathological point of view, proving, as it undoubtedly does, that changes in texture are influenced by causes quite independent of the state of the local circulation.”

“Although nearly every remedy in the Pharmacopœia was tried, none seemed to have the least effect; and she gradually got well, it might be said, in spite of medicine.”

CASE X.—Mrs. ———, aged 82, of a robust and healthy constitution, florid complexion, in February, 1839, had a slight paralytic affection of the left arm and leg, preceded and accompanied by headache, vertigo, flashes of light before the eyes, etc. About one month later she experienced a sensation of cold in the right foot, which, on rubbing the part, gave place to a feeling of heat and itching. On examination, she found that the anterior half of the foot was swollen and red. In about three weeks from the first seizure, the sensation of cold continuing, it became extremely painful, and she then applied for medical advice.

Aug. 1839. Complaints of severe pain in anterior part of right foot, which is swollen and red; there is considerable œdema of the ankle and lower part of the leg; the extremities of the toes are dark red, with some lividity. Her general health is good, with the exception of occasional headache with vertigo. Bowels free; appetite good; pulse regular.

Liniment and leeches gave some relief.

Two weeks later, as the pain, redness, and swelling exhibited exacerbations, recurring every second day, quinine was tried in various ways without benefit. The pain was now of a most excruciating character. Sometimes one toe, and

sometimes two or more were simultaneously attacked; and in proportion to the intensity of the pain, the affected parts became swollen, red, and then of a shining purple hue.

She was then ordered twenty minims of the wine of colchicum root three times daily, in an ounce of camphor mixture; and a poultice was applied containing one-half ounce of extract of hemlock, and ten grains of watery extract of opium, with one pint of decoction of white poppy. This gave great relief, and in two weeks the foot had almost assumed its natural appearance. The pain became of a different character, and resembled the sensation called "asleep;" and former applications became intolerable—even the hemlock poultices.

Two months and a half later the foot had lost all pain and assumed a natural appearance.

About one month later she had another stroke, and soon died.

"It is obvious that the good effect of the colchicum may excite suspicion that the inflammation was of a gouty nature; still, however, the manner in which it so gradually began, the remarkable violence of the pain, and the change of colour in the skin which accompanied each paroxysm, were of so striking a character, and presented analogies with the case of the young lady before related so obvious, that the histories are placed side by side.

"The absence of dyspepsia, and all constitutional or local symptoms of gout, up to the age of eighty-two; the freedom from gouty deposits, which the urine exhibited throughout the whole course of the old lady's malady; and various circumstances that cannot have escaped your notice, render the hypothesis which ascribed her suffering to gout more than doubtful, and the doubt is still further increased by the very gradual manner in which the disease subsided under the use of colchicum, and its preserving the 'tertian' character to the end."

The pain of the foot and toes was so great, and the discoloration and purple hue of the skin so intense that senile gangrene was apprehended.

Sir James Paget has described a case which somewhat resembles these, and is a remarkable illustration of vaso-motor disturbances. I do not speak of it as precisely like my own or Graves' cases.

CASE XI.—The patient, a young man, desirous of "hardening" himself, stood in cold water up to his knees for eight mornings, and endured at the same time a cold shower-bath. These brought on disturbances in the blood-supply to his feet, so that walking caused them to become cold, white and numb, and aching when he ceased walking; they pretty rapidly flushed, growing ruddy and hot, with over-filling of the veins while the pain subsided.

It is curious that in the cases I have given, or quoted, exercise caused the feet to flush and grow painful, while in this one, exertion afoot produced contraction of the vessels, with pain, and rest after exercise brought about flushing.

Exercise naturally increases the flow of blood to a part, and in the cases I have reported there seems to have been an exaggeration of this natural result, and more rarely, and only in some cases, a contraction of the vessels, as though the controlling centres were sometimes in a paretic, and sometimes in an excitable state. It is, however, unwise to speculate physiologically until we are in possession of a far larger number of these interesting cases.

I shall therefore content myself with calling attention briefly to some other forms of painful feet with which the present disorder may be confounded, and I do this the more readily, because I myself have, I fear, confounded two distinct maladies in my former paper.

The disorder for which this one might most readily be mistaken was briefly mentioned by Prof. Gross in his "Surgery" as podynia, and was described by him as a disease peculiar to tailors. In my own paper (*Phila. Med. Times*) I gave a more detailed account of it. It consists essentially of pain in or about some parts of the sole of the feet. The pain is apt to come even in well-formed feet, and to persist for years. It is an ache or burning pain, and is unaccompanied by marked redness or swelling, nor is it ever complicated with other sensory or motor troubles.

It is made worse by heat and much covering, as well as by exercise, and has been ascribed by Dr. Gross to a subacute inflammation of the periosteum. I have, however, seen at least two cases in which, after some years of pain, there was very distinct evidence of ankylosis, and joint-troubles among the small bones of the foot, so that I am disposed to regard it as due originally to a low grade of inflammation of the complicated joint surfaces of this member.

I give five cases as illustrations of this annoying malady.

CASE XII.—The patient, a man of 20 years, consulted me on account of a pain and burning in the feet. He was tall, in fair general condition, but subject to occasional attacks of palpitation of the heart, which were at times severe and prolonged, and for which neither in his habits nor in the heart itself could I find a competent cause. He was, however, easily wearied; and, as he worked in an iron-foundry, was apt to be very tired by nightfall. After some two years of such labour, he began to have every evening pain and ache, with burning. By and by it came earlier in the day, and at last attacked him whenever he was an hour or two on his feet. Occasionally, after great exertion, the feet flushed a little, but did not swell. Summer was the time of the greatest torment, and a cool day gave more or less relief. After a time the pain became so severe that he was forced to seek a sedentary occupation, after which the pain, on the whole, became less, although ready to appear anew whenever he took too much exercise on foot. I should add that, although some years have now gone by, this tendency still continues, while in no other way does the patient show any manner of disease.

I have lately asked anew concerning this case, and find that the trouble still persists, some fifteen years having gone by since it began.

The feet were well formed, and there was no taint in the ancestry, and no history of gout, rheumatism, or syphilis. It was a mild case of pedal pain.

CASE XIII.—In June, 1871, I saw the next instance of this obstinate disorder. Mr. C., æt. thirty-seven; married. A healthy, well-built man, free from any constitutional taint, and never having had gout or rheumatism. When nineteen years of age, Mr. C. lived on a farm and worked as a field-hand to learn the business. After a few months, and in mid-summer, he began to feel in the feet a sense of weariness—a fatigue and sore feeling, as if he had walked too long. As this grew worse it came to last over night, and was then eased by walking in the morning. At last the soles became so sore that he would sometimes crawl down stairs in the

morning on his knees, and after cooling his feet with pump-water would pull on his boots. There was neither redness nor swelling, and the soles were the chief seat of pain, which was a dull, heavy ache, always much under the control of temperature, heat increasing and cold relieving it. The autumn and winter brought entire ease.

He quitted the business of farming, and became a clerk. During nine years he walked a good deal, and felt each summer some slight return of annoyance, but the winter brought absolute relief. When twenty-nine years old, a change of business brought with it heavier responsibilities and a great increase of exercise on foot.

The first warm weather in May caused a return of the foot-trouble, from which, up to this time, nine years, he has not been altogether without discomfort at any time.

The pain and suffering in his first attack were unlike those of the other cases, but when they returned they differed little from these. The heat of summer and too much foot-covering increased the pain and the readiness with which exercise caused it, while cold had exactly a reverse influence.

After walking for a time, he felt as if there was a cushion under the toes and the ball of the foot. Then the foot burned and pricked, and these latter feelings, which were so sharp at times as to amount to stinging, became worse for a little while when resting after a walk. His mode of relief was to bare his feet and place them on a higher level than the remainder of his body. At no time was there redness or swelling, and only once or twice could I find spots of tenderness on the sides of the feet, which, I should add, were well formed.

This case, like the last one, persisted under every mode of treatment I could devise, and is, I believe, rather worse to-day than better.

CASE XIV.—My next case came to me from Dr. James King, of Pittsburg. The patient, aged twenty-one, managed, at the time I saw him, a large printing-office. He was healthy up to 1864, when, after an extended army service, he had ague, which clung to him a long time. Returning home, much weakened in health, he began for the first time in his life to have, after long walks or after standing for a time, vague pains in both feet. Disregarding these, he continued to be much on his feet, and engaged in a business which taxed severely all his powers; and soon his annoyance increased so much as to cause him to seek for aid.

When I saw him in 1868, he was suffering most gravely. Usually he arose in the morning free from pain, but it came on in one or two hours, and increased in severity as long as he remained active and on foot. It thus happened that by nightfall both feet were aching, and so painful as to make further exertion impossible. The seat of pain was not distinctly fixed, being rather, as he said, throughout the feet. There was never at any time swelling, but once or twice a month some great excess of movement would cause the feet to be slightly flushed. At times also, as in the evening or whenever unusual or sudden exercise had been taken, the pain was of a burning character, and the feet throbbled. At such times they became tender, and were so sore that pressure or the effort to pull on a boot caused extreme pain.

The patient was free from heart-disease or other troubles, functional or organic, and, like the previous case, had not had gout or rheumatism.

As in the other cases, the summer brought more intense pain, and it

was in hot weather easily induced by the slightest exertion; while winter brought not only a general relief, but also enabled him to walk much longer without producing pain. Having learned these facts very early, he saved himself suffering as much as possible by wearing the lightest of foot-coverings. Later in his case the pain was chiefly on the sides of the feet, and at all times he could obtain perfect relief or insure freedom from annoyance by rest in the recumbent position. In October, 1868, Dr. C. B. King, of Pittsburg, writes to me that he has carefully watched the patient while applying electricity, and that he has never seen the feet either red or swollen. He adds that the right foot is the worse of the two, and that the severest pain is in the centre of the sole. He could find no tender points when the patient had been for a while without exercise, as in the mornings; and when the feet were worst the tenderness varied in position, and was usually general and not acute or in limited localities; neither was it seated in the muscular tissues of the feet, an observation which I myself confirmed on several occasions.

In 1875 I saw this patient, and prescribed various treatments, none of which helped him for more than a few days. At one time iodides seemed to be of use, at another blisters and cups, hot and cold douches. Rest, galvanism, all manner of liniments, and a variety of baths were tried in vain. During his disease he was in the hands of the ablest and most ingenious of our profession in and out of Philadelphia, but with one and all the result was the same.

Dr. James King writes me recently, Feb. 1878, that the pain still continues under certain circumstances. In spring and autumn especially, the approach of a storm always causes pain, which remains until the weather becomes clear. In summer and winter storms affect him less, and this form of evil influence is intensified by any depression of health. Walking or standing increases the pain, and when seated he turns his feet inwards so that the soles face one another, while more ease is obtained by elevating the feet. He has tried, since I saw him, various changes of climate and locality, and thinks he was made worse by the use of electricity and acupuncture. Attention to his general health, free use of quinia and of cold water, have aided him most. At present his feet are habitually cold. I may add that he inherits on the maternal side a very nervous temperament, and that his father suffers from hereditary gout.

CASE XV.—In November, 1874, Dr. Stone brought to me a salesman, C. H. A., æt. 21, in a state of great suffering. In November, 1873, without hurt or excessive exertion, this young man began to have, when walking or standing, pain-ache and burning in the ball of the left foot. It covered the whole ball, and thence affected the heel, but never the intervening arch of the foot. The right foot was attacked in like fashion two months later, but it began in the heel and passed to the ball of the foot. The pain was intense, was made worse by excessive covering of the feet, was better on awakening in the morning, but became more sore during the morning, and, as he rested in the afternoons, it grew then less annoying. There has been all along a literally drenching sweat of the feet. When seen by me, both soles, and indeed the whole of the feet, were a little puffy and swollen. The calves were remarkably flabby, but there were no spinal symptoms. So great was the pain, that the patient was forced to crawl about. No constitutional or other cause could be assigned for this trouble. The feet were tender at times, but until the disease had lasted a year, mere movement of the toes, without pressure, caused no annoy-

ance. I exhausted my ingenuity in efforts to relieve this case, which, however, left the hospital unaided. To-day, February 20th, 1878, I saw the patient again, and learned that very slowly he has become better. I observe, however, that while the sweats have ceased, and the pain grown very much less, three of the smaller toes of the left foot seem to have partially lost power to extend themselves, and that the metacarpo-phalangeal joint of the third toe is sore on motion, and that there is considerable limitation of motion in the metacarpo-phalangeal articulations, and an unusual want of freedom of passive motion in the small bones of the carpus.

CASE XVI.—One of the worst cases I have seen came to me from Dr. Corson, of Norristown. After every other means had failed in my hands, and those of several able physicians, Dr. T. G. Morton twice operated on the feet in the manner which he describes in the following note :—

The first operation : a narrow, long, straight bistoury was carried in at the most prominent part of the heel posteriorly, and all the tissues were freely divided from side to side ; the edge of the knife was then turned towards the os calcis, and the tissues directly on the bone were freely incised, several longitudinal cuts being made.

The second operation was similar to the first, save that the division of the tissues from side to side was more complete ; after this, a portion of linen soaked in carbolized oil (1 pt. to 15) was carried through the puncture, and the wound fully stuffed with it ; at the end of three days this was withdrawn, and the part poulticed.

The parts healed rapidly in each instance.

The first operation gave great ease for three months, so that he could walk with the aid of a cane. Then he relapsed, and since the second operation has been worse than before.

Gout and rheumatism at times afford instances of painful soles, but these get well readily, and the still rarer form of tender feet which follows typhoid fever, though more mysterious in origin, also ends in recovery after one or two months.

Almost as rare are the cases of tender feet from syphilis. I have seen but two cases—one of them within a month. In both, a very careful examination after prolonged soaking in hot water, so as to soften the soles, revealed nodes on the bones of the feet. In both instances these were on the heel, and caused the patient to walk in an odd fashion on the ball of the feet, so as to save the diseased parts from pressure.

ARTICLE II.

A CASE OF SPAYING FOR FIBROID TUMOUR OF THE WOMB. By WILLIAM GOODELL, A.M., M.D., Professor of Clinical Gynæcology in the University of Pennsylvania.

SOME five years ago Dr. R. Battéy startled the medical profession by proposing the removal of the ovaries for those mental or those physical disorders

in women upon which menstruation exerts a pernicious influence. His theory was, and a plausible one it is, that, since many of these disorders are kept up by the monthly afflux of blood, and are therefore incurable during menstrual life, the only chance for their immediate relief lies in the establishment of an artificial menopause. To effect this change of life he advocated the extirpation of both ovaries, and labelled the operation Normal Ovariectomy. With this name fault has been found, because it does not cover the whole ground, for in some of the cases operated upon the ovaries were themselves diseased. Now, since it is important to distinguish this operation from that of ovariectomy proper, and since it is not easy to define it, except by circumlocution, I shall call it *spaying*—a term which as technically defines the character of the operation, as that of castration defines the analogous operation in the male.

Among the disorders of menstrual life which are made worse by the monthly determinations of blood to the womb, and for which spaying has been successfully tried are dysmenorrhœa, convulsions, pelvic hæmatoceles, and pelvic abscesses, recurring at the monthly periods. It has also been resorted to for supposed ovarian neuralgia, for hysteria and insanity with menstrual exacerbations, and for epilepsy with an ovarian aura. The success, however, in these latter cases has been qualified, because the origin of reflex symptoms is not always discoverable; because pelvic pains need not have an ovarian source; because hysteria, epilepsy, and insanity may be imponderables, or sheer brain lesions, and wholly unconnected with the sexual apparatus.

But about fibroid tumours of the womb there can be no doubt. The relation here between cause and effect is unmistakable. Their growth and their morbid effects are notably increased at each monthly flux, and notably lessened after the climacteric. In but few other pelvic disorders can we so positively single out the ovaries as the peccant organs.

Many fibroid tumours of the womb are harmless, giving small token of their presence. But when once they begin to give trouble there is no limit to the amount of suffering they may cause, while the means of relief at our disposal are limited. Hypodermic injections of ergotine often fail; electrolysis is yet in its infancy; avulsion of the fibroid or its enucleation can rarely be performed; whilst the removal of the tumour by abdominal section, or the extirpation of the womb itself, are among the most desperate remedies known to science.

Now if, under such conditions, we could by any means so lessen the sexual or the periodic congestions of the womb, as to shorten the blood-rations of these growths, the presumption is that the hemorrhages would either stop or abate, that the pains would become less cruel, and that the tumours would cease to grow. "You take my life," says Shylock, "when you do take the means whereby I live." The ovaries being then pre-eminently sexual organs, and, therefore, the means whereby these tumours

live, *à priori* reasoning would suggest their extirpation. Let us see whether such logic has been sustained by clinical experience :—

Prof. E. H. Trenholme,¹ of Montreal, reports a case of interstitial and subperitoneal fibroids of the womb, in which the health began to fail from intolerable uterine tormina and from serious metrorrhagia. The os uteri was on five occasions slit open with a knife, and the mucous surface of the tumour freely cauterized with caustic potash. The relief following these operations being only temporary, the removal of the ovaries was decided upon. An abdominal incision, five inches in length, being accordingly made, “the ovaries were found low down in their normal position, and not above the brim of the pelvis, as the position of the uterus and fibroids would lead one to suspect.” Each pedicle was ligated with carbolized white dressmakers’ thread, No. 20, and dropped back. The patient recovered without a bad symptom, and on the twelfth day went out for a sleigh-ride. For three successive months after the operation she had a uterine hemorrhage. It then ceased, and the woman “gained much in flesh and strength.” Two years later, under the date of January 28, 1878, Prof. Trenholme wrote to me about her as follows : “There have been occasional, but not regular discharges, to the extent of about a teaspoonful, of pure blood, and no appearance of menses otherwise. Patient is well enough to be at a medical college in ———. The tumour is rather smaller than when the operation was made. I regard the operation a success.”

Two other cases are reported by Prof. Hegar,² of Freiburg. The women were perishing from hemorrhages caused by irremediable fibroid tumours of the womb. This distinguished gynæcologist removed both ovaries from each woman by the abdominal incision. In each case convalescence was uninterrupted, the menopause was established, and the tumour became smaller. A fourth case is an unpublished one operated upon by Prof. Nussbaum, of Munich, and evidently with success, as the following extract from his letter to me would imply : “I performed the double ovariectomy in consequence of a fibrous state of the womb. In this case, the period appeared twice distinctly after the operation, and then it ceased altogether.”

The fifth case happened in my own practice, and is as follows :—

A. B., aged 33, a literary maiden lady, began to menstruate when thirteen years old, but always with pain. Twelve years ago sacral pains and menorrhagia began to trouble her, and her dysmenorrhœa grew worse. Before long a constant and worrying pain developed in the left hypochondrium, which was unsuccessfully treated first as a malarial affection of the spleen, and afterwards as some lesion of the left kidney. Apart from this pain, she, in the autumn of 1875, began to suffer at her monthlies with an excruciating pain in the left ovarian region. It was a “twisting,” a “rending,” or a “bursting” pain, as she described it. One week before each monthly period this pain began, and steadily grew worse, until it became unbearable. The flow then appeared, but with no abatement of her sufferings. It lasted not less than a week, and was very profuse. Next followed a

¹ Obstetric Journal of Great Britain, Oct. 1876, p. 430.

² Medical Times and Gazette, October 27, 1877, p. 466, from Centralblatt für Gynækologie, May 26, 1877, No. 5.

week of gradual mitigation of all these distressing symptoms. Thus three weeks out of every four were virtually spent by her in bed. Worn out by loss of blood and by her acute pains, which were finally pronounced to be nervous in their character, she, in the autumn of 1876, consulted my friend, Dr. Weir Mitchell. He at once suspected a uterine origin, and, in October, 1876, asked me to see her.

The lady was pale, thin, and bloodless, with a face furrowed by acute suffering. I found a virginal cervix lodged on the symphysis pubis, and a sharply ante-flexed womb imbedded in the hilus of a large and kidney-shaped fibroid tumour. Although the sound gave a measurement of but three inches, the tumour dipped down to the bottom of Douglas's pouch, and reached up to a point two fingers' breadth above the navel and to its left. The unexpanded cervix pouted out from one side of the tumour, bearing to it the same relation as the nose bears to the face. The fibroid was plainly subperitoneal, and not amenable to treatment per vaginam.

Thereafter, Dr. Mitchell and I met frequently. We first tried ergot, which, although evoking very severe uterine tormina, increased the bleeding. Once, indeed, while under its full action, she flooded so profusely as greatly to alarm her friends and her attending physician. Gallic acid did better, but it was not well borne by the stomach. Various other remedies, both local and constitutional, were resorted to without any benefit whatever. The only mixture which really did her any good was one of cinnamon water, containing in each tablespoonful ten grains of ammonium chloride, and one-twelfth of a grain of hydrargyrum bichloride. This was given thrice daily, and on it she at one time seemed to thrive. But the improvement was transient, and she soon steadily began to go down hill. Worn out by her sufferings, she became a monomaniac on the subject, and gave neither Dr. Mitchell nor myself any peace until she had extorted from us a promise to extirpate the womb. My chief objection to the operation lay in the encroachment of the growth upon the cervix, by which very little room was left for the application of a ligature.

While we were waiting for the summer to pass away, I happened to recall Trenholme's case (Hegar's two cases had not yet appeared in our medical journals), and we were led by his success to decide upon the removal of the ovaries.

No sooner was this decision announced to our patient than she insisted upon having the operation performed at once. She indeed grew so morbidly importunate and so unreasonable on the subject, as to make her friends apprehensive of insanity, but we firmly waited for the warm season to end. On October 4, 1877, with the aid of Drs. Weir Mitchell, John Ashhurst, C. T. Hunter, B. F. Baer, and W. Heath, I proceeded to operate. After placing our patient on her side, and after introducing the duck-bill speculum, I caught up by a uterine tenaculum a fold of the post-cervical mucous membrane, and with a pair of Kuchenmeister's scissors incised the vagina to the extent of about an inch and a half. The peritoneum being in like manner snipped open, I passed in my left index finger. By pressing down the tumour with the free hand, I was now able to hook my finger into the sling made by the oviduct, and securely hold each ovary alternately, while I seized it with a fenestrated forceps, and brought it into the vagina. The stalk of each one was next transfixed with a double fine silk thread and securely tied. The ovaries were then removed, the ligatures cut off at the knot, and the stumps returned into the pelvic cavity. The right ovary looked healthy, but the left contained a small

cyst. Very trifling was the loss of blood during the operation; no vessel needed tying, and not a suture was put into the vaginal wound.

Following this operation there was an immediate effacement of all the facial furrows of suffering. From that day she lost all those pains and aches which had embittered her menstrual life. No special surgical symptoms supervened, and her convalescence would have been uninterrupted, but for the reaction from the previous overstrain of her nervous system. An hysterical explosion spent itself in dyspnoea, in wandering pains and in paroxysms of great prostration and of excessive nausea. By firm moral treatment she got the whip-handle of herself, and did well. For two weeks after the operation her linen was stained by a slight oozing of blood, but whether it came from the wound or the womb I cannot say.

On the 16th she went home with hardly a pain or an ache. On the 20th I found her up and sewing. November 19th she came to my office in the highest spirits, overflowing with joy and gratitude. She had walked at one stretch last week ten Philadelphia blocks, which make just one mile. She sleeps without anodynes, and has a keen appetite. December 7th she came to consult me about the merest show of blood, which began five days ago and has lasted ever since. It barely stains her under-clothing, and needs no guard; but she feels anxious lest it should turn out to be an effort at menstruation. If it be indeed a monthly period, it is the first one since the operation, and the first one for many years which she has not spent in bed and in great agony. The Sunday following she walked fully one mile to church, joined without fatigue in its rites, and returned home on foot. So impressed was she by this proof of returning health, that she at once wrote me a grateful letter of thanks.

December 17th. To-day she consulted me about a soreness high up in the vagina, and about the slight weeping of blood, which had not yet stopped. For the first time since the operation I examined her, and found on the site of the wound a small caruncle or neuroma, which bled at the slightest touch, and was extremely sensitive. After blunting its sensibility with carbolic acid I snipped it off. I took this opportunity to make a careful examination, and, to my surprise, found the womb astonishingly lessened in size, fully one-half. Instead of reaching to two fingers' breadth above the navel, the top of the tumour now lay half-way between the navel and the symphysis pubis. By February 20, 1878, she had gained twelve and a half pounds in weight, and was looking and feeling extremely well. The tumour is now so much reduced in size as to need searching after. That portion of it which filled up Douglas's pouch has disappeared. The rest lies behind and below the pubic arch.

April 4th. It is only from my previous knowledge of her case that I was enabled to-day to discover a slight fibroid enlargement of the womb. This information was gained by careful double palpation, for the sound gives a natural length to the womb. Since this date I have repeatedly seen her, but have not made any further uterine examination. She has not passed a single day in bed since her convalescence from the operation, and practically is wholly cured of her disorder.

Thus we see that clinical experience has, to a remarkable degree, sustained the logic of *a priori* reasoning, and that, in certain conditions of fibroid tumour, the removal of the ovaries is a warrantable operation. But under what conditions does it so become? And does it offer the best chance of rescuing a woman from hopeless suffering or from an early

death? For, of course, unless there be danger or great suffering, no such radical operation for a fibroid tumour of the womb would be justifiable.

Whenever the growth projects fairly into the uterine cavity, there can be no question that its removal by avulsion should always be first tried. Of the value of this operation I can speak in positive terms, having performed it six times. In all, the operation was by no means easy, and in two very tedious—the tumour being removed piece-meal—but then no vestige of the parasite was left behind, and the women were restored to complete health, save in one instance, in which death from heart-clot took place on the sixteenth day after the operation. Unfortunately, however, the fibroid does not often lie under the mucous membrane. Its site is usually under the peritoneum or within the uterine wall, and therefore this operation becomes available in only a small percentage of cases.

In instituting a comparison between spaying and the enucleation of the fibroid per vaginam, it might, at first blush, seem the better to resort to the latter means. Firstly, because such an operation would bring about an absolute cure. Secondly, because the tumour is a foreign body—an excrescence—whose removal would make the woman a more perfect creature. Further, the ovaries are important organs, and their extirpation means mutilation, a mutilation causing barrenness and possibly marked psychological changes. Nor, indeed, can we positively depend upon such a mutilation to bring about the menopause or any reduction in the bulk of the tumour. But, as a make-weight, the offending growth is generally mural or subperitoneal, and therefore inaccessible; whilst even in that rarer form, which bulges into the uterine cavity, the operation of enucleation cannot always be undertaken. On the other hand, the ovaries can always be removed, and that by a completed operation which is relatively less serious than either successful or unsuccessful attempts at enucleation. Out of twenty-eight cases of enucleation collected by West, fourteen proved fatal.¹ As regards three of my own cases, in which the capsule of the tumour was merely cut through to a limited extent, and partly peeled off, one died of peritonitis within seventy-two hours; in another the tumour subsequently enucleated itself; in the third no appreciable change took place in the tumour, but the hemorrhages ceased. In view of these facts, I am by no means sure that when the question comes to lie between the removal of the ovaries and the gradual enucleation of a fibroid imprisoned by an undilated os uteri, the former will not be the operation of the future.

When, however, vaginal enucleation is impracticable, and the question is reduced to one of three, viz., spaying, or enucleation by gastrotomy, or the extirpation of the invaded womb, there is to my mind but one answer, and that one in favour of spaying. My reasons for expressing this belief are, the greater mortality of the other two operations, and the greater

¹ Diseases of Women, p. 307.

mutilation made by the last one. Thus Kœberlé, of Strasbourg, has collected twenty cases of gastrotomy, with extirpation of pedunculated fibrous tumours of the womb, by ligature or by enucleation. Yet, although these growths had stalks, and were, therefore, in the best possible condition for being removed, twelve women out of the twenty perished. Again, Dr. Pozzi, of Paris, has published an elaborate thesis upon *The Value of Hysterotomy in the Treatment of Fibrous Tumours of the Womb*, in which he furnishes seventy-five new cases of this operation above the number previously collected by Kœberlé, Caternault, and Péan. His statistical tables thus embody one hundred and nineteen cases in which gastrotomy was performed for the removal of fibroid tumours of the womb. Of these 77 were fatal and 42 successful. Arguing from 18 other cases, 10 of them being his own, Dr. G. Kimball, from whose excellent paper on *Extirpation of the Uterus*¹ I glean this information, makes the following comment on Pozzi's statistics: "There is good reason to believe that, upon an honest count of the entire number of such operations, it would be seen that but a small proportion of them have ever been brought before the profession; and as for results, it is probably not unjust to suppose that at least eight out of every ten such cases have proved fatal." "The uterus," writes Dr. Thomas Keith, "has been pretty frequently removed in Scotland, but all the cases proved fatal with the exception of my solitary three. I need hardly say that the fatal cases are never published."²

Thomas³ gives two tables. In one there are recorded 18 deaths to 6 recoveries. In the other, which he deems the more trustworthy, there stand 11 deaths to one recovery.

In view of such a frightful mortality, to say nothing of the great mutilation of the survivors, extirpation of the womb for fibroid tumour, while not absolutely unjustifiable, should never be resorted to except as an extreme measure; and, in my opinion, not until every other known means, including spaying, has previously been tried. I am not, indeed, sure that in cases of sessile, fibro-cystic tumours existing during menstrual life, it would not be well first to try to arrest their growth by the ablation of the ovaries, before resorting to the major operation.

In contrast with this appalling death-record, every published case of spaying for fibroid has, up to the present time, proved successful, not only in so far as life is concerned, but also in its effect upon the tumour. But since the number of these cases is too small to establish general conclusions, it would here be a pertinent inquiry to analyze all the known cases of spaying. By this means we shall discover, firstly, the general mortality of the operation; and, secondly, the relative mortality between the abdominal and the vaginal incision.

The following table shows the number of times the operation of spaying

¹ Transactions American Medical Association, vol. xxviii. 1877, p. 322.

² Ibid.

³ Diseases of Women, 1874, p. 520.

has been performed, the name of each operator, the mode of operating, and the number of deaths :—

Operator.	Number of cases.	Abdominal incision.	Recovery.	Death.	Vaginal incision.	Recovery.	Death.
Dr. R. Battey ¹	12	2	2	...	10	8	2
Dr. Marion Sims ²	7	3	2	1	4	4	...
Dr. George J. Engelman ³	3	3	...	3	...	...	...
Dr. Hegar, of Freiburg ⁴	2	2	2	...	...	...	...
Dr. T. G. Thomas ⁵	2	2	1	1	...	...	...
Dr. E. H. Trenholme ⁶	2	1	1	...	1	1	...
Dr. Wm. Goodell	2	...	...	...	2	2	...
Dr. E. R. Peaslee ⁷	1	1	...	1	...	...	...
Dr. T. T. Sabine ⁸	1	1	1	...	...	...	...
Dr. J. von Nussbaum, ⁹ of Munich	1	1	1	...	...	...	...
	33	16	10	6	17	15	2

To these I think it but fair to add the seven cases of vaginal ovariectomy which I have published elsewhere.¹⁰ In these cases the cysts ranged in size from an orange to the womb at term, yet in not one instance was the operation followed by death.

From the above table, then, it appears that out of a total of thirty-three cases of spaying eight have died. As regards the relative value of the two modes of performing the operation, it will be seen that out of sixteen cases in which the abdominal incision was employed six died; whilst, out of the seventeen cases in which the ovaries were removed by the vaginal incision, only two died. Now, if to the latter be added the seven cases of vaginal ovariectomy, we shall have but two deaths in a total of twenty-four cases in which one ovary or both ovaries have been removed *per vaginam*.

The ancients evidently deemed this operation a comparatively harmless one, and not unfrequently resorted to it. Strabo and other writers aver that "certain kings of Lydia caused the ovaries of women to be removed, using them sometimes in their service and sometimes for their pleasure."¹¹

¹ Trans. Am. Gynæcological Soc., vol. i. p. 119.

² British Med. Journal, Dec. 8, 1877.

³ Personal communication, March 30, 1878.

⁴ Centralblatt f. Gynäkologie, May 26, 1877, No. 5.

⁵ Trans. Am. Gynæcological Soc., vol. i. p. 352.

⁶ Obstetrical Journal of Great Britain, October, 1876, p. 426.

⁷ Trans. Am. Gynæcological Soc., vol. i.

⁸ New York Med. Journal, January, 1875, p. 41.

⁹ Personal communication, February 12, 1878.

¹⁰ A Case of Vaginal Ovariectomy. By Wm. Goodell, M.D., published in Transactions American Gynæcological Society, vol. ii. 1877.

¹¹ Ovarian Tumours. By E. R. Peaslee, M.D., ed. 1872, p. 226.

Then, there is that oft-told story of the Hungarian sow-gelder, who is said to have cured the lewdness of his daughter by removing her ovaries. In these cases, moreover, the incision was undoubtedly abdominal. Yet it is a curious fact, established by Englisch,¹ that of the cases in which extirpation of a healthy irreducible ovary was performed for hernia of that organ, one-half died of subperitoneal inflammation and its results.

The next question which presses for an answer is: How shall the operation be performed? From the foregoing table it appears that the vaginal operation is the safer one. This is undoubtedly attributable to the greatly lessened exposure of the peritoneum, and to the dependent drainage opening. Whether it is as easy an operation as the other remains yet to be seen. Whenever the ovaries are carried up by a large tumour, they may lie beyond the reach of the finger introduced *per vaginam*. Yet in my case, in spite of a tumour of great size, the glands were caught and extirpated with no great difficulty, much less, in fact, than in my second case of spaying, one for pernicious menstruation threatening insanity, in which there was no tumour to dislocate the ovaries.

In an analogous case, Trenholme found the ovaries "low down in their normal position, and not above the brim of the pelvis, as the position of the uterus and fibroids would lead one to suppose." Again, strong pelvic adhesions may interfere with such a mode of spaying. Thomas reports a case in which he attempted to remove, *per vaginam*, an ovary as large as an egg, but failed on account of abundant adhesions.² The gland was finally extirpated by the abdominal incision, but fatal peritonitis set in. Sims says of one of his cases,³ "The ovaries were firmly bound down by strong bands of false membrane, and it was impossible for me to dislodge them. . . . I was forced to abandon the operation." Battey writes of his fourth case that, owing to pelvic adhesions, "it was found to be impracticable to isolate the gland entire, and I contented myself with such disintegration as I could effect with my finger-nail." Cases eight and nine of his series "were so complicated with pelvic deposits of lymph that it could not be asserted that the ovaries were cleanly removed." If, however, the operation through Douglas's pouch should fail, the final resort could always be made to the abdominal incision, and the abandoned vaginal incision be utilized as a drainage opening.

Candour compels me to note one very serious drawback to the operation of spaying. For some inexplicable reason, the removal of both ovaries does not always bring about the desired "Change of Life." Ovulation, of course, ceases, but a periodical metrostaxis may go on as before. Now, it is not within the scope of this paper to discuss the theory of this non-ovular menstruation; whether it be due to the force of habit, or to a law

¹ Sydenham Year Book, 1871-72, p. 293.

² Transactions American Gynæcological Society, vol. i. p. 352.

³ British Medical Journal, December, 1877.

of periodicity, or to some fragment of ovarian stroma left behind by the operator, or to supplemental ovarian tissue contained between the peritoneal layers of the Broad Ligament. What we, as practical physicians, have to deal with is the important and unexpected fact that uterine discharges of blood sometimes keep on long after the ablation of both ovaries. This being the case, it will be pertinent to inquire how far we may depend upon such an operation to put an end to the menstrual flux. In other words, what proportion of women who have lost both ovaries menstruate?

It is a fact worthy of note that during the week following the ablation of one or both ovaries, a sanguineous discharge usually takes place from the womb. This happened in both of my cases of spaying, but it is in no wise a menstruation, but a metrostaxis set up by the irritation of the ovarian nerves caused by the means adopted to secure the pedicle. It is therefore more likely to happen when both ovaries are removed, for then two sets of ovarian nerves are injured by the clamp, or the ligature, or the écraseur. Such fluxes, even when repeated once or twice, do not mean a continuance of menstruation, and I have so labelled them in my tables.

To obtain the data for the following tables much correspondence was needed, and I here take the opportunity of recording my thanks to the distinguished gentlemen, at home and abroad, who were kind enough to answer my inquiries. Among the last letters written by the lamented Peaslee was one giving me his personal experience on this point.

Table of Cases in which so-called Menstruation kept on after the Removal of both Ovaries.

No.	Operator.	Age	Quoted from:—	Menstruation.
1	Verneuil, M.	36	Annales de Gynécologie, August, 1877, p. 145	None for 6 months, then for 6 months every alternate mo. afterwards regularly.
2	Storer, H. R.	..	American Journal of Med. Sci., January, 1868, p. 81	Uninterrupted.
3	Atlee, W. L.	35	Atlee's Ovarian Tumours, p. 35	"
4	" "	31	" " " "	"
5	" "	40	" " " " p. 38	"
6	" "	..	Personal communication, dated Dec. 17, 1877	For 5 months, then died.
7	Meadows, A.	..	Lancet, 1872, p. 290	For 6 months, was then lost sight of.
8	" "	..	Am. Supplement to Obstet. Journ. of Great Britain, vol. ii, p. 5	For 3 months after operation, and then was lost sight of.
9	Jackson, R. A.	44	Chicago Med. Journ., Oct. 1870, p. 585	Uninterrupted.
10	Le Fort	..	" " " "	"
11	Brown, I. Baker	..	" " " "	Irregular.
12	Köberlé	..	Peaslee, Ovarian Tumours, p. 528	All of the womb excepting cervix was also removed.
13	Batthey, R.	35	Trans. Am. Gynec. Soc., vol. i., 1877, p. 119	At intervals of from 3 to 7 months.
14	Thomas, T. G.	..	Am. Journ. of Obstetrics, Oct. 1877, p. 665	Irregular for 6 months, when last heard of.
15	Kimball, G.	48	Personal communication of January 22, 1878	Irregular for 5 months, when she died.
16	Trenholme, E. H.	32	Obstetric Journ. of Great Britain, Oct. 1876, p. 425, and per. com.	Irregular discharges of a drachm of blood.
17	Burnham, W.	32	Personal communication of January 18, 1878	Regular, but less in quantity.
18	Thornton, J. K.	24	Obstetric Journ. of Great Britain, Feb. 1878, p. 723	Irregular, but with relief to flushes and headache.
19	Wells, T. S.	29	Diseases of Ovaries, p. 434	Uninterrupted.
20	Bird, F.	32	Lancet, October 30, 1847, p. 467	"

Another very curious and unexpected fact elicited by these inquiries, is the recurrence of so-called menstruation, even after the removal of the womb itself together with ovaries. Kœberlé¹ notes such a circumstance as occurring in a case in which the cervix uteri alone was left behind. Storer² completely extirpated the womb and ovaries, yet on the nineteenth day a sanguineous discharge, lasting thirty hours, took place from the vagina. Burnham writes to me that after such an operation, "several months after the recovery, seemingly a perfect one, there occurred from the vagina quite a copious discharge, tinged with blood, which continued for one day, and was never followed by any recurrence."

After such facts as these, one is prepared to accept the further statement that menstruation not only has gone on, but has become excessive, after cystic or other disease has invaded both ovaries and wholly destroyed them—at least, apparently so. Examples of this kind are furnished by Bühring and Beigel, and by Mayrhofer,³ who quotes them. A very interesting case is told by M. Terrier.⁴ He removed one ovary for cystic disease. The woman died two years after, and, although the remaining ovary was found wholly altered and cystic, she had menstruated up to the time of her death. Sinety makes an analogous observation,⁵ which, however, is beyond my reach. But the climax is reached by Atlee,⁶ who gives two cases in which, one ovary having been removed, the other became so diseased as to need repeatedappings, and yet each woman not only menstruated but gave birth to a child.

From these tables it appears that out of ninety-eight cases of extirpation of both ovaries during menstrual life, there were twelve which had, so far as I can learn, regular monthly fluxes, and eight in which such fluxes were either irregular or lessened in amount.

This is a large average, much larger than one would suspect. But, although very carefully deduced, it is, I am sure, untrustworthy, and for the following reason: Every case of double ovariectomy has not been published; but, so opposed to our preconceived ideas is the recurrence of menstruation after the removal of both ovaries, that every such case has been deemed worthy of note. Acting on this presumption I have included in my table of arrested menstruation some cases in which no allusion has been made by the operator to the subsequent menstrual history; taking it for granted that had a monthly flow continued the fact would have been deemed of sufficient importance to be noted.

¹ Peaslee on Ovarian Tumours, p. 523.

² Am. Journal of Medical Sciences, January, 1866, p. 119.

³ Wiener Medizinische Wochenschrift, Feb. 1875, p. 130.

⁴ Bulletin et Mém. de la Société de Chirurgie, 1876, t. ii. p. 551.

⁵ Bulletin de la Société de Biologie; Séance Decembre 2, 1872.

⁶ Atlee, Ovarian Tumours, pp. 38 and 39.

Table of Cases in which the Removal of both Ovaries during the Menstrual period of life was followed by the Cessation of the Menses.

No.	Operator.	Age	Quoted from:—	Remarks.
1	Pott, Percival	23	Peaslee on Ovarian Tumours, p. 226	No menstruation.
2	Peaslee, E. R.	24	Am. Journ. Med. Sci., April, 1851, p. 385	"
3	" "	39	Am. Journ. Med. Sci., July, 1864, p. 47	"
4	" "	35	Am. Journ. Med. Sci., July, 1865, p. 98	"
5	" "	22	Personal communication, Jan. 5, 1878	"In three of these cases there was metrostaxis occurring from one to four days after the operation, and continuing from two to four days."
6	" "	27	Personal communication, Jan. 5, 1878	
7	" "	28	Personal communication, Jan. 5, 1878	
8	" "	31	Personal communication, Jan. 5, 1878	
9	" "	31	Personal communication, Jan. 5, 1878	
10	" "	34	Personal communication, Jan. 5, 1878	
11	" "	37	Personal communication, Jan. 5, 1878	No menstruation.
12	" "	37	Personal communication, Jan. 5, 1878	
13	Atlee, J. L.	29	Am. Journ. Med. Sciences, 1844, p. 44	No menstruation.
14	Atlee, W. L.	19	Ovarian Tumours, p. 36	No red menstruation, but a white discharge.
15	" "	..	Personal communication, Dec. 17, 1877	No menstruation.
16	Hegar	..	Centralblatt f. Gynäk., May 26, 1877, No. 5	"
17	"	..	Centralblatt f. Gynäk., May 26, 1877, No. 5	"
18	Storer, H. R.	43	Chicago Med. Journ., Oct. 1870, p. 586	One sanguineous discharge.
19	Kimball, G.	..	Personal communication of Jan. 22, 1878	"Menstruated once, but only once."
20	" "	..	Personal communication of Jan. 22, 1878	"No symptoms of menstruation of any kind whatever."
21	Thomas, T. G.	..	Trans. Am. Gynec. Soc. vol. i. 1877, p. 352	Metrostaxis for 5 months, then stopped.
22	" "	..	Am. Journ. of Obstetrics, Oct. 1877, p. 665	No menstruation.
23	" "	..	Am. Journ. of Obstetrics, Oct. 1877, p. 665	" "
24	" "	..	Am. Journ. of Obstetrics, Oct. 1877, p. 665	" "
25	" "	..	Am. Journ. of Obstetrics, Oct. 1877, p. 665	" "
26	" "	..	Am. Journ. of Obstetrics, Oct. 1877, p. 665	" "
27	" "	..	Am. Journ. of Obstetrics, Oct. 1877, p. 665	" "
28	" "	..	Am. Journ. of Obstetrics, Oct. 1877, p. 665	" "
29	Burnham, W.	28	Personal communication of Jan. 18, 1877	" "
30	" "	36	Personal communication of Jan. 18, 1877	One profuse discharge; died 4 months later from cancer
31	" "	38	Personal communication of Jan. 18, 1877	No menstruation, but patient soon lost sight of.
32 ¹	" "	48	Personal communication of Jan. 18, 1877	Two hemorrhages at 3 months' interval.
33	Dunlap, A.	..	Personal communication of Jan. 24, 1878	Menstruation never returned.
34	" "	..	Personal communication of Jan. 24, 1878	" " "
35	Spiegelberg, O.	..	Personal communication of Feb. 11, 1878	"Never heard that these women ever since menstruated."
36	" "	..	Personal communication of Feb. 11, 1878	

¹ Although this woman was 48 years old I include her case, because her menstruation would probably have continued several years longer, as she miscarried of twins six weeks before operation.

No.	Operator.	Age	Quoted from:—	Remarks.
37	Nussbaum	..	Personal communication of Feb. 12, 1878	One metrostaxis.
38	"	..	Personal communication of Feb. 12, 1878	"The period appeared twice distinctly, then ceased altogether."
39	"	..	Personal communication of Feb. 12, 1878	No menstruation.
40	"	..	Personal communication of Feb. 12, 1878	" "
41	"	..	Personal communication of Feb. 12, 1878	" "
42	"	..	Personal communication of Feb. 12, 1878	" "
43	Batley, R.	34	British Medical Journal, Dec. 8, 1877	Atresia vaginæ; dreadful menstrual molimina cured.
44	"	..	Trans. Am. Gynecological Soc. vol. i. 1877, p. 119	No menstruation.
45	"	..	Trans. Am. Gynecological Soc. vol. i. 1877, p. 119	For several months menstrual molimina came back without discharge.
46	Clay, C.	..	Chicago Medical Journal, Oct. 1870, p. 587	Three of these cases had one metrostaxis.
47	"	..	Chicago Medical Journal, Oct. 1870, p. 587	
48	"	..	Chicago Medical Journal, Oct. 1870, p. 587	
49	"	..	Chicago Medical Journal, Oct. 1870, p. 587	
50	Kœberlé	37	Peaslee, Am. Journ. Med. Sci., Jan. 1865, p. 98	No menstruation.
51	Brown, I. B.	45	Peaslee, Am. Journ. Med. Sci., Jan. 1865, p. 98	" "
52	Byford, W. H.	..	Personal communication, dated Dec. 28, 1877	No menstruation. All were under observation from two- and a half to five years after the operation.
53	"	..	Personal communication, dated Dec. 28, 1877	
5	"	..	Personal communication, dated Dec. 28, 1877	
55	Sabine, T. T.	..	Personal communication, dated Feb. 11, 1878	"Not the least sign of menstruation."
56	Wells, T. S.	37	Diseases of Ovaries, 1873, p. 434	No menstruation.
57	"	34	" " " "	"
58	"	39	" " " "	"
59	"	22	" " " "	"
60	"	39	" " " "	"
61	"	22	" " " "	"
62	"	36	" " " "	"
63	"	26	" " " p. 449	"
64	Jackson	27	" " " p. 475	"
65	Sims, J. M.	29	Am. Med. Times, June, 1862, p. 335	Second ovary forced out by vomiting, and shrunk away.
66	Tait, L.	..	Tait's Diseases of Women, Lond. 1877, p. 285	No menstruation whatever.
67	Emmet, T. A.	35	Personal communication, April 25, 1878	One metrostaxis.
68	"	39	Personal communication, April 25, 1878	No menstruation.
69	Greene, W. W.	..	Boston Med. and Surg. Journ., March 2, 1871, p. 138	Each had the usual sanguineous discharge once, and one twice.
70	"	..	Boston Med. and Surg. Journ., March 2, 1871, p. 138	
71	"	..	Boston Med. and Surg. Journ., March 2, 1871, p. 138	
72	"	..	Boston Med. and Surg. Journ., March 2, 1871, p. 138	
73	Keith, T.	42	Edinburgh Medical Journal, Jan. 1866	Each had the usual sanguineous discharge shortly after the operation.
74	"	32	Edinburgh Medical Journal, December, 1866	
75	"	49	Edinburgh Medical Journal, November, 1867	
76	"	42	Edinburgh Medical Journal, December, 1867	
77	Goodell, W.	35		One metrostaxis.
78 ¹	"	27		" "

¹ In the British Medical Journal (January 26, 1878, p. 125) eleven additional cases of double ovariectomy are reported, but, since neither the age nor the menstrual history of the patient is given, I am unable to utilize them.

The actual percentage, then, of recurring menstruation is not large enough to deter one from performing this operation for the purpose of establishing the menopause. But, granting that menstruation keeps on, will its continuance impair the success of the operation? Now, although menstruation, in the sense of a monthly flow of blood, may not cease, yet ovulation ends, and with it the ovular molimen. Consequently such a metrostaxis is merely a blood-leakage, and therefore unattended by that assemblage of nervous and congestive determinations, and by all those reflex symptoms which unite to make up the molimen of pernicious ovular menstruation. To that extent, therefore, may we hope for benefit. Thus, in Battey's first case, although an irregular uterine hemorrhage continued, the woman was cured of very distressing menstrual symptoms, for the relief of which the operation was undertaken. Trenholme's case proved a success in spite "of occasional but not regular discharges" of blood.

Does spaying after puberty unsex a woman? So far as can be ascertained it does not; at least not more than castration after puberty unsexes a man. In the one the ability to inseminate is lost; in the other the capability of being inseminated; but in both the sexual feelings remain pretty much the same. Males who have lost their testes after the age of puberty retain the power of erection, and even of ejaculation; but the fluid is, of course, merely a lubricating one. The amorous proclivities of the ox or of the steer are the scandal of our streets. Alive to these facts, oriental jealousy demands in a eunuch the complete ablation of the genital organs.¹ Not only are the testes therefore removed, but also the scrotum and the penis. Hence, to avoid the soiling of his clothes, every eunuch carries a silver catheter in his pocket. The seat of sexuality in a woman has long been sought for, but in vain. The clitoris has been amputated, the nymphæ have been excised, and the ovaries removed, yet the sexual desire has remained unquenched. Its seat has not been found, because sexuality is not a member or an organ, but a sense—a sense dependent on the sexual apparatus, not for its being, but merely for its fruition. On this account I have quite recently refused to remove the ovaries from a young woman who is afflicted with uncontrollable nymphomania, although both she and her physician urged the trial of the operation.

In confirmation of these views, Battey notes² in his cases of spaying the persistence of aphrodisiac power—a persistence so constant as to forbid any expectation of curing nymphomania by the operation. Nor in any of them was "there a loss of the womanly graces, but, on the contrary, the patient gains flesh, and becomes even more attractive." This opinion is sustained

¹ North American Medico-Chirurgical Review, May, 1861, p. 500; New York Medical Record, June, 1870, p. 190; Medical and Surgical Reporter, April 24, 1875, p. 329.

² Transactions American Gynecological Society, 1876, p. 119.

by Wells, and also by Peaslee, who writes:¹ "Double ovariectomy as a rule is not followed by any loss of the special characteristics of woman; the only decided physiological change being a final cessation of menstruation, as well as of ovulation. Three of my own patients, married and highly educated ladies, after recovery again became splendid examples of womanhood, enjoying the most perfect health, and retaining all their former attributes of mind, as well as of body, and with undiminished sensory capacities in their matrimonial relations." Atlee reports a case of double ovariectomy, in which marriage took place after the operation, as "the sexual feelings were normal." Six months after the operation Verneuil found² his patient with well-developed breasts, and decidedly fatter. "She, in fact, seemed far more of a woman than before the operation." In the one of my two cases the physical condition of the woman was in every way improved. She became more plump and better looking. All traces of suffering were effaced, and she is not conscious of any psychological changes. In the other, a lady under the professional care of my friend, Dr. Charles A. McCall, I performed the operation on the 19th of last March, and a sufficient length of time has not yet elapsed to warrant any definite conclusions on this point. I may, however, say that, up to the present time, she is just as womanly, and as much of a woman as she was before the operation.

ARTICLE III.

ON THE TREATMENT OF UTERINE FIBROIDS WITH GALVANISM BY PROFOUND PUNCTURE. Illustrated by fifty cases occurring in the practice of GILMAN KIMBALL, M.D., of Lowell, and EPHRAIM CUTTER, M.D., of Cambridge, Mass. Reported by E. CUTTER, M.D.

THE fact that three-fourths of utero-abdominal tumours are fibroids, and that they have hitherto been considered practically incurable, justifies the institution of new methods of treatment. With this view, in August, 1871, we began to treat uterine fibroids with galvanism by profound puncture, hoping thereby to arrest their growth. Up to the present time we have so treated fifty cases, with the following results, which were far beyond our most sanguine expectations. In seven cases the growth was not arrested; four died; in thirty-two the growth was arrested; three cases were relieved, and four cured.

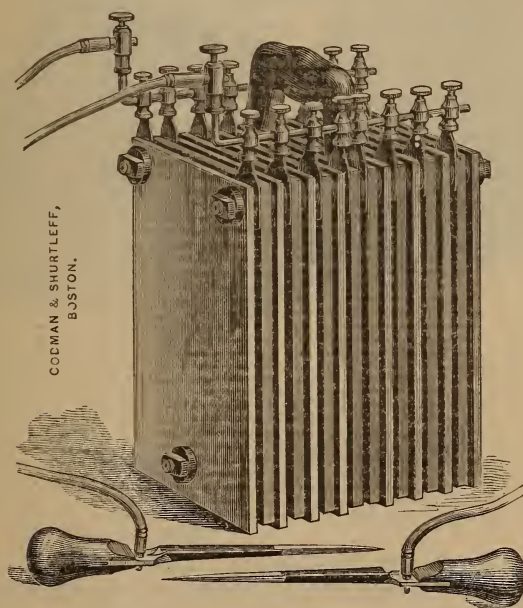
The battery and electrodes which we use are shown in Fig. 1, and were devised specially with a view to strength and portability. The battery consists of eight plates, each of carbon and zinc, 9 by 6 inches. The

¹ Diseases of the Ovary, p. 530.

² Annales de Gynécologie, August, 1877, p. 146.

first four pairs are arranged Z. C., and the remaining four C. Z. They are pierced with three circular holes, arranged triangularly; two at the top, and one in the centre, below. Cylinders of hard rubber run through and secure the plates in position by means of nuts. The conductors are made of copper, and are properly insulated; at their extremities are the electrodes especially devised by Dr. Cutter for use in this operation. Fig. 2 shows the rattan-lined cells and the tray, and Fig. 3 the method of application of the electrodes. The solution used in the battery is made by the following formula: Potassii bichromate (saturated solution) Oj; sulphuric acid $\mathfrak{z}$ viij. This battery recommended itself, as we were impressed with the idea that quantity of current was what was required, and that it must be profoundly applied, and the galvanic action confined to the tumour alone.

Fig. 1.



It may be said that we have never known a case where this battery was used in these operations in which the zinc electrodes did not come away readily and the carbon electrode did not stick in the tissues. This we cite as evidence of the passage of a galvanic current through the electrodes.

The duration of the application of the electrodes has varied from three to fifteen minutes. In each individual case the applications have varied in number from one to nineteen, at intervals of from seven to fourteen days. The patient should be made to understand that the operation is a

matter involving arrangements whereby she may lie abed and be cared for, and the possible severity of the operation and the risks that are run should be impressed upon her. The operation should not be performed hastily, or without the most careful and accurate diagnosis having been previously made.

Fig. 2.

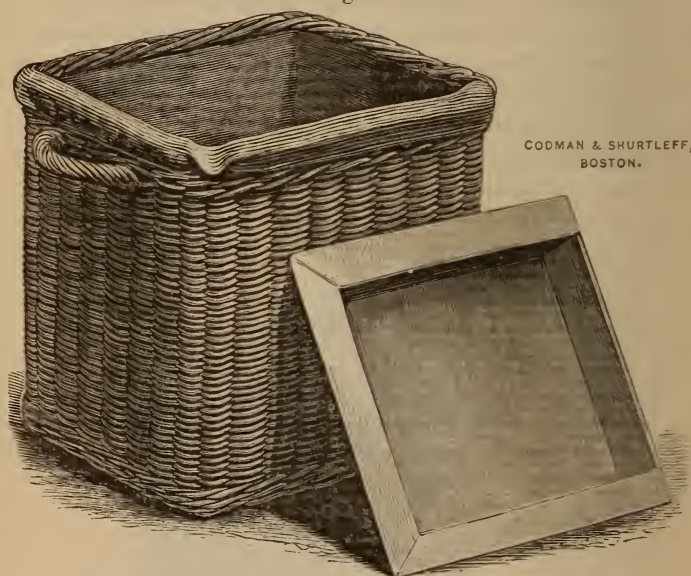


Fig. 3.



1. *Cases in which the progress of the disease was not arrested by the operation.*

CASE I.—Mrs. Robert P. (Reported in full by Dr. W. Symington Brown, of Stoneham, Mass., in *Med. and Surg. Rep.*, Feb. 8, 1873.) Fibro-myoma. Two trials of galvanism. Improved feelings after second operation; otherwise no favourable result. Patient disgusted, and refused further applications. Death from exhaustion and hemorrhage, Dec. 11, 1872. *Date of operations*: Aug. 21, 1871, two needles applied through the vagina. Current passed fifteen minutes.

Eight days later, Aug. 29, Dr. Kimball was present, and passed the needles. Current continued ten minutes.

Autopsy made by Dr. Brown. Weight of tumour, uterus and appendages, four pounds.

This case is of interest because it was the *first* of and the occasion of the present series of cases. Its full history shows how these operations came about. It shows also the natural history of a fatal termination of the case itself in death. It was the first case where a regular and determined effort was made to try the effect of electricity upon a regularly diagnosed case of uterine fibroid, proved to be so after death.

If there had not been a fixed *determination* to settle the question, the result of this case would have deterred us from any further procedures. We were disappointed, but not discouraged. The encouraging systemic improvement was overlooked in the general cloud of dissatisfaction that settled down over this case.

CASE II.—Mrs. Morse, Waltham, Mass., 40 years of age, dressmaker. Size suggests a six months' pregnancy. Fibroid involves the body, but not the cervix uteri. Frequent micturition. Obligated to abandon her occupation on account of this disease.

April 21, 1874. First application. Ether. Electrodes penetrated through the abdominal walls $3\frac{1}{2}$ inches. Current ten minutes.

24th. Second application.

May 24. Third application. The tumour had increased in size. Free oozing of serum through punctures. Other operations proved it to be obstinate. The tumour was removed by Dr. Kimball by the abdominal section. It was attached by a broad band to the uterus. *The interstitial uterine portion gave no evidence of its existence.* It had disappeared. The patient recovered perfectly, and was alive at last accounts. Because Cæsarean section was resorted to before relief, this case was ruled to be a failure for galvanism. Still it should have the credit of the dissidence of the uterine portion.

CASE III.—Mrs. M., Waltham, 44 years old, May 13, 1875; married nineteen years. Menorrhagia ever since. Childless. Dressmaker. Fibroid perceptible for eight years. Size indicates a weight of twelve or fifteen pounds. Suffers from pressure and distension. Lost flesh of late, and finds the duties of her trade fatiguing and irksome.

This day galvanism applied. One electrode through abdomen, and the other per vaginam. Sense of nervous prostration.

June 11. Both electrodes through the abdominal wall. No trouble.

15th. Last operation repeated.

17th. One electrode through abdomen, and the other through vagina. No relief or arrest. Patient alive. Condition as before operating.

CASE IV.—Miss Doudiet, school-teacher, New Haven, Ct., 35 years old. She has submitted to a few operations with, as yet, no relief nor arrest. In progress.

CASE V.—1877, Feb. 1. A married Irish woman, multipara, was operated on for a fibroid. No injury or other effect was produced except to frighten her husband, who, when Dr. Kimball proceeded to his house to apply the battery for the second time, strongly and bulldoggishly objected on monetary grounds, and further treatment was suspended. Not heard from since.

CASE VI.—Mrs. H., married, 40 years of age. Chicago. Seen by Prof. Byford, Drs. Fisher, Hyde, Clark, Fitch, W. C. Smith, and Dr. Jones, family physician. All coincided in the diagnosis of growth in

pelvis, attached to and incorporated with the uterus. Multilobar tumour in abdomen. Fibro ovarian. One puncture. Operation not completed. It was recommended to use a small battery per cutan method.

CASE VII.—Mrs. S., Boston. Large tumour. Passed over as hopeless and incurable, as several applications were made, all without good or bad result. Life became such a burden that gastrotomy was resorted to, and the tumour removed. Death from peritonitis, fourteen days afterwards. Present Drs. F. Semeleder, of Mexico, Bixby, of Boston, Conn. of Concord, N. H., and Cutter.

II. Fatal cases.

CASE VIII.—In 1864 Miss H., Portsmouth, N. H., consulted Dr. Kimball for a fibroid tumour. Told that nothing could be done. Ten years after, June, 1874, she was 28 years of age, unmarried. Tumour very much larger. Although not in a very promising condition, her importunity was yielded to, and galvanism applied the day after her arrival. Aspiration punctured a cyst apparently, but only bloody serum was procured. Copious flow of serum followed the introduction of the electrodes, running through the grooves; continued twenty-four hours. There was a decided *diminution*, probably owing to the evacuation.

A second operation was performed later in June. There was pain in the abdomen, vomiting, headache, prostration, etc. All disappeared in twenty-four hours. Later in the same month a third operation was performed. Greater pain, more prostration, and severe vomiting followed, but disappeared on the following day. The patient was confident that the tumour was lessened. The bad symptoms recurred, combined with those of typhoid fever of an asthenic type, of which she died in about four weeks after the last operation.

This was the first fatal case that occurred. It is possible that it was a malignant form; no autopsy. The patient had made up her mind for the operation from hearing of other cases. In this curious psychological condition nothing is satisfactory but trying the ordeal. When held back one said, "I don't care if I do die." This result teaches that the surgeon should not allow his acting against the dictates of his judgment.

CASE IX.—A childless wife, aged 50 years, consulted Dr. Kimball. Noticed her fibroid in February, 1874. Pelvic and abdominal. Hardish feel and equivocal touch. Thought it might be ovarian, but decided it was as stated.

Feb. '75.—Galvanism was applied once; through the abdominal walls for ten minutes. Next day, feeling nicely, she, contrary to orders, got up, put on her clothes, and went about the house as if nothing had happened. The house was not warmed by furnace or steam heat, and as some rooms were cold naturally she was exposed, took cold, and went back to bed sick. Abdomen swelled and bloated; temperature 100°; pulse slow. Death occurred six weeks after the operation.

The autopsy showed no morbid changes about the site of punctures, but a rent one inch in length was discovered on the deep part of the cyst, opposite the punctures.

The history up to the time of her getting up against advice and exposing herself is that of many other cases. For this reason it is felt hardly just

to charge her death to the interference. We have no desire to shirk responsibility and insert it in its place with a recommendation to a favourable consideration. The sad result brought some bad reputation on the operation with those who did not know all the facts.

CASE X.—Mrs. Underwood, Rockland, Mass., widow, 50 years old in 1874. One child. Abdominal tumour, at first very hard; after two applications, assumes a cystic form; diminution; returned home and remained two months.

When she came back to the hospital for the third operation, the tumour was found to have changed; became soft, and felt like a monocyte; no pain, but mental trouble from her bulk; at the application, fluid of a sanguinolent character copiously exuded through the punctures. This was not followed by chill or fever, but her case assumed a typhoid aspect; still she was able to return home shortly after. She foolishly refused to have a physician until moribund. Her symptoms were of septicæmia. She died in fourteen weeks after the third operation. No one knows but that she might have recovered had she received even ordinary attention. She had better have remained in the hospital.

CASE XI.—1876, Aug. 4, Miss F. C. C., Stoneham, Mass., spinster, age 44, presented herself to Dr. Cutter to have galvanism applied to a large fibroid of ten years' standing, that blocked the pelvis, packed the vagina, and crowded the rectum. The uterus could not be detected. Eight to ten small, freely moving lobes could be readily felt in the abdomen, which was tender. She stated that her sufferings had been so acute that she used 3j. sulphate of morphia weekly, and that her hope was to be able to dispense with her drug if the operation relieved her pain, as it had remarkably done in a case she knew of. She understood and took all the risks.

Aug. 12. Present, Drs. F. A. Sawyer, of Wareham, and F. H. Luce, of Falmouth, Mass. One electrode was passed through the rectum and one through the abdomen, right of navel. Ten minutes. Pulse did not vary from 86° throughout. Subsequently there was vomiting and pain, but her *great pain* was gone, and she importuned for another application. She was put off till August 24th, when the operation was repeated. Ten minutes. The systemic symptoms owing to the morphia habit showed no sign of too great a dose.

29th. Pale and prostrated; pain over puncture; pulse a little quickened. 30th. Worse; severe colic; right hypogastric region swelled. Sept. 4th. Pulse 96°; resp. 24; comparatively comfortable; coarse rales scattered here and there through the chest; belly swelled and tender; conscious and rational. 8th. Death from peritonitis occurred. Dr. Luce, of Falmouth, her physician, writes: pulse 120 to 130, small; temp. 103° to 104°; nausea, and finally delirium before demise; no autopsy.

When the deep penetration of the abdominal cavity in these procedures is considered, it appears remarkable that more deaths have not occurred. It seems as if the galvanic current confers immunity. No inflammatory results were reported in Gen. Kilpatrick's angiomatic cervical tumour, which was cured by a constant current in one application of half an hour. Four deaths out of fifty cases does not give a large percentage for so grave an operation as this. It hardly seems right to deny

to a victim of morphia the chances of the benefits of the operation, but this instance teaches extra caution and moderation.

III. *Cases in which the progress of the disease was arrested by the operation.*

CASE XII.—Mrs. F., of Springfield, Mass. This was the second case in point of time. Dr. D. F. Lincoln, of New York City, furnished two electrolysis needles six inches long, one and one-sixteenth of an inch in diameter, cylindrical platinum tips, body insulated. Patient aged 40, married. The tumour was a large pelvic fibro-myoma of several years growth, very hard and irregular; filled the pelvis, and rose up in the abdomen to an extent indicating a seven months' pregnancy. The frequent metrorrhagia, marked anemia, prostration, rapid increase of tumour, and the almost unbearable distension bespoke its true character. Operated upon at Lowell Dec. 26th, 1871. Present, Drs. Kimball and Cutter. *No anæsthetic was used.* Two electrodes were introduced through the abdominal walls about six inches apart on either side of the median line. They extend with great difficulty; became twisted and bent. The penetration was only three-quarters of an inch. A penetration of *three or four inches at least was intended.* Current passed seven minutes. The pulse rose from 70° to 120° . Lost its fulness; the face became pale and pinched; cold sweat covered the forehead; hands, feet, legs, and forearms were pale and cold. The patient uttered half-suppressed expressions of intense agony. Death seemed imminent. The operation was followed by considerable prostration and sharp abdominal pain lasting several days. 1872, Jan. 1. The operation was repeated in the same manner exactly, and with very similar systemic results.

For six weeks after, Dr. Kimball daily observed the patient. No special change was noticed as regards the tumour; certainly no increase in size appeared—a fact of great significance, *considering that for weeks previous to the first application the growth was rapidly advancing, and causing great suffering from distension.* Defective and unsatisfactory as were the experiments in this case, owing to the imperfect construction of the electrodes, the effect upon the general condition of the patient proved on the whole very gratifying. Within three weeks from the first trial, her general health began to improve, appetite and strength returned; the tumour was arrested; at last accounts patient was living at Newton, Mass., much benefited.

This case was reported in the *Boston Med. and Surg. Journ.*, Jan. 29th, 1874, p. 108. It shows the natural history, so to speak, of the operation *without anæsthesia*. The Hippocratic countenance and the systemic signs of collapse all point to an exhibition of a very profound influence. It shows that it is cruel and dangerous not to use anæsthesia.

This case was also the *first one* in which the *electrodes were plunged directly through the abdominal peritoneum.* *The credit of this belongs to Dr. Kimball.*

After the operations on Case XII. it was decided that the essays must be abandoned unless some better needles could be devised that would, for example, penetrate a bullock's testicle. Such an instrument would, it was thought, meet the requirements. It was the lot of the writer to undertake

to supply this want; noticing the twisting, it was thought best to have it done before introduction. So an electrode was produced fashioned like a cork-screw. This showed that the difficulty lay in the cylindrical form. The tissues bind on the whole periphery of the needle because they gripe all round. If this gripe could be relieved the needle would penetrate more readily.

Casting about for expedients, a surgeon's director was selected; this gave much promise, and time has perfectly realized it. Without disparaging other needles, it can be truly said that this one has never disappointed expectations, and no better needle has been desired.

CASE XIII.—Mrs. T., widow, Hubbardston, Mass., 40 years old, childless. Large pelvic and abdominal fibro-myoma. Anasarca, ascites, orthopnoea.

"The first experiment with the battery was made Nov. 26, 1873, under the direction of Dr. Cutter. His newly constructed electrodes were used for the first time." No anæsthesia. One needle penetrated through the abdominal walls *four inches* instead of three-quarters of an inch in Case XII. Current five minutes; local suffering severe for the first twelve hours. The urinary secretion was quadrupled in quantity. In less than one week the dropsy disappeared altogether. But the most striking effect was the almost instantaneous and perfect relief from the dyspnoea. For the first time in many months she was permitted to lie down in bed and enjoy rest and sleep equal to that of the healthiest period of her life. After a short period a second application was made. One electrode through the abdominal wall and the other through the vagina; three inches. Four-minute current.

"The third and last operation two weeks later. The tumour became sensibly diminished in size. May 1 Dr. Kimball departed for Europe, and no further applications were made. The condition of the patient, so recently giving promise of a permanent relief, gradually gave way to a return of her previous bad symptoms. Death occurred about the middle of July, ten weeks after she was last seen by Dr. Kimball.

"As regards what might have been the result of a longer continued application, it is of course a matter of mere conjecture; but allowing the case to have been absolutely beyond the reach of cure by any known remedy, the power of galvanism in affording such relief from suffering, as shown in this particular instance, furnishes sufficient reason for regarding it as something better than a therapeutic agent of a merely fancied value." (Reported in full in *Boston Med. and Surg. Journ.*, Jan. 29, 1874, p. 110.)

CASE XIV.—Mrs. Peters, coloured, a patient of Dr. W. G. Wheeler, of Chelsea, Massachusetts (to whom acknowledgment is here given for assistance, encouragement, and share of responsibility), age 41 years, childless. Tumour an enormous multilobar, very dense fibromyoid of ten years' standing. March 2, 1875. Great distension from ascites. Largest abdominal circumference forty-four inches. Several times she had suffered from severe peritonitis. These attacks were quite serious, confining her to bed about three days at a time; at other times the weight and tenderness were productive of much suffering, and she was almost disabled. This day, in the presence of Drs. Wheeler, Shackford, and Weeks, of Chelsea, under ether, I passed both electrodes through the

abdominal wall four inches each. Current five minutes. Pulse normal throughout. Serous fluid exuded, but not enough to account for the disappearance of the ascites. It did not reappear until just before death. She was calm and heroic. March 27. Second application; she was feeling well, in good spirits, and able to work. Electrodes passed as before. Ten-minute current. An unusual and profuse flow of urine, lasting several days, with increased systemic disturbance followed. Tumour apparently arrested. She went through the summer well, and demonstrated her improved health by keeping a house full of boarders, doing all the work herself. When approached with reference to a third operation, she said, "I feel well enough, and don't see why I should go to bed for two or three days simply to please Dr. Wheeler and Dr. Cutter; besides I am too busy."

1876, March 4, she submitted to the third application. Six physicians were present, among them Dr. S. G. Webber, of Boston. Some had seen her before, and expressed the opinion that the tumour had diminished since the last operation. Patient etherized. Electrodes were passed in the largest lobe on the right side of the abdomen. Five-minute current. *The electrodes were then withdrawn and reintroduced* into another lobe on the left side. Five-minute current. She was profoundly impressed with the double application, but in a few days she was so comfortable that it was thought best to let her alone for a time.

This is the first instance of *four* punctures made at one operation. It should not be practised in any case unless one is *sure* he is dealing with a good subject, that is, one who has borne the shock well, and shown that she is capable of a profound impression without too much systemic disturbance. During the summer of 1876 she had an attack of peritonitis like those before the galvanism. Dr. Wheeler states that the inflammation was situated away from the site of punctures. No bad results followed, and Mrs. Peters continued in the enjoyment of good health up to Oct. 29, 1876, the growth of tumour being arrested. On this day she submitted to the *fourth* application in the presence of Prof. T. G. Thomas and Dr. J. B. Hunter, of New York, Dr. F. Semeleder, of Mexico, formerly a Professor in Vienna and Surgeon-in-Chief to Maximilian's forces in Mexico, and Drs. G. H. Bixby, G. C. Gay, L. F. Warner, and J. G. Blake, of Boston, Wheeler, Fenwick, Haskell, Shackford, and Weeks, of Chelsea, Sullivan, of Malden, Marcy and Cutter, of Cambridge.

All interested examined and satisfied themselves of the character of the tumour being a subperitoneal, dense, and multilobar fibroid. The pulse was noted to be normal, the skin cool, and the patient to be in good condition for the operation. She was etherized. The abdomen was exposed. The electrodes were lubricated with olive oil. One was then thrust through the lower part of the large ovoid flattened lobe on the left side of the navel, from below upwards, to the depth of four inches. The other electrode was taken in the hand, the handle resting in the palm, held against the ball of the thumb by the little, ring, and middle fingers of the right hand, the free edges of the laminae being placed upwards, the index-finger pressing against the outer side of the blade of the electrode at about its middle, the point of the thumb also pressing against the upper surface of the flattened proximal end of the blade. This disposition of the parts of the hand giving a perfect control of the instrument, the tumour was steadied by the operator's left hand, and the second electrode was slowly and continuously driven into the lobe, approaching but not touching the

other electrode. The depth of penetration was *four* inches, so that the insulated portion of the electrode came within the skin. As the second conductor was attached, contractions of the abdominal muscles demonstrated the passage of the current.

The patient was watched, and as long as there were no symptoms of systemic disturbance the current was continued until ten minutes had elapsed. In withdrawing the electrodes two fingers should be placed close to the point of entrance, and hold the tissues in contact with the tumour as the instrument is withdrawn. As the patient was not apparently much affected, the operation was immediately repeated. One needle was thrust into the large lobe to the *left* of the navel, and the other into a small lobe on the right. The current was continued for six minutes. The pulse was accelerated. She began to look pale and became restless. These symptoms were noticed as indicating the extent to which the application should be carried.

Oct. 31. She was found feeling prostrated. Bowels tender and sore; pulse good. Still she was dressed and sitting in a rocking-chair by an open window. This was closed and caution administered.

Nov. 4. Was seen in the act of sitting down to a fish-dinner she had just cooked. Appetite good.

Dec. 12. She recovered and did well until she moved her residence to another quarter of the city. Took cold, and injured herself by lifting. Constipation, fever, pain, and tenderness of the belly, followed with loss of sleep and appetite. Dr. W. gave her castor-oil and morphia. The larger lobe on the left felt boggy and soft. No wave.

29th. It seems she attended a funeral, and stood on the frozen ground at the grave during the burial services. Now suffering much with vomiting, diarrhœa, delirium. Belly tender and sore.

1877, Jan. 4. Reported better, but confined to bed.

17th. Pain shooting down the right side.

March 28. Much better. Measured 44 inches. Her clothes have become at least six inches looser than they were. Ready for boarders.

Sept. 18. Received a note from Dr. Wheeler that she died on the 16th. Four weeks previous had an attack of dysentery. This was checked, so that she was quite comfortable. Peritonitis followed, and death from exhaustion.

Autopsy.—Body much emaciated. Peritoneum firmly adherent throughout. Oij ascitic fluid removed. The fibroids were agglomerated into an irregular mass of a grayish-white colour, mottled; in some parts of the colour of beefsteak dotted with white points. The whole appeared like a mass of tallow. The lobes were joined as if set in cement. Adhesions dense and tough. Dissecting off the intestines the fibroids were found to spring from the uterus, which was lost in the general mass. It appeared as a cylinder one inch in diameter, depth five inches. To the right of uterus a large lobe pointed downwards into the pelvis. It contained a central cavity as large as a walnut, filled with pus. It could not be connected with the electrodes. Above, on the right, was an irregular lobe $2\frac{1}{2}$ inches in diameter, semi-solid, somewhat purulent, penetrated by an irregular opening large enough to admit the forefinger. This might have been due to the electrode. The largest lobe displayed a uniform surface, white and cartilaginous. There were no marks of the electrodes that had repeatedly penetrated it. Coagulated lymph, partly organized, plastered over the tumour and the intestines, which were almost black and gangrenous. Kidneys, liver, and spleen healthy.

Micrography.—The fluid with difficulty scraped from the cut surfaces of the lobes displayed. Curling connective fibres; red blood-corpuscles; large mother-cells; other cells of varying sizes; innumerable granules, most of them swarming with independent molecular motions. From the density, the varying histological elements, and the macroscopy, the degeneration was probably cancerous.

This case is given at length as its history is complete, and it will save details in the relation of the remaining cases, which must be brief.

CASE XV.—Miss Bridget C., single, 24 years of age; patient of Dr. F. A. Howe, Newburyport. Dense fibro-myoma, pelvic and abdominal, three inches above the navel. Applications, six. Present, Drs. Graves and Fuller, of Lowell. "Sure her tumour was lessened, because her clothes were looser." Perfect relief of pressure on bladder.

Hemorrhage uncontrolled, death therefrom a year afterwards. Tumour did not increase in size. (Reported in *Boston Med. and Surg. Journ.*, Jan. 29, 1874.)

CASE XVI.—Mrs. D., Marlboro', Mass., 1873. Oct. 15. Thirty-eight years. Two children. Interstitial fibroid. Pain. Hemorrhages. Bed-ridden for nine weeks. Nov. 1. Five-minute current. Chloroform. Present Dr. Charles Putnam, of Marlboro', family physician. Dec. 17. Tumour diminished one-third and decidedly softer. Hemorrhage checked. In a week's time she had been able to ride out, and go about the town as well as she ever did. Second application. Galvanism for the third time Feb., 1874. Tumour still diminishing. An unusual effect was noticed at this operation, namely, a sudden gush of blood from the uterus. It ceased in a few minutes. Two years afterwards tumour regained its size. She was in good health at last accounts.

CASE XVII.—1873. Mrs. Allen, of Marlboro', Mass. Widow. Forty-three years. Three children. Large interstitial fibroid, irregular, pressing on the rectum. Very pale and languid from loss of blood. Menorrhagia excessive for years. Persistent and uncontrollable hemorrhage between menses. Chloroform. *Operations.* Urine very abundant, chills, fever, thirst, pulse 120. Tumour reduced one-half. Meno- and metrorrhagia checked. Health restored.

CASE XVIII.—Miss D., Fisherville, N. H. Single. Forty-three years of age. Growth very solid. Size giving the idea of a six months' pregnancy. Pelvis packed. Hemorrhages frequent and exhaustive. Disabled. 1874, Feb. 18. Chloroform. Current ten minutes. No pain. Two days after tumour seemed soft. Aspirated. Got bloody serum. *Second application* Feb. 26, 1874, followed by hemorrhages. Went to Concord, N. H. Hemorrhages ceased after return home in April, but prostration continued. Discharges of fetid matter from the uterus. Sometime after death ensued, and an autopsy proved it to be a case of cancerous degeneration.

CASE XIX.—Mrs. Clemena B., Bridgewater, Mass. Fifty-three years old. October 15, 1874. Childless marriage. Anasarca and ascites. Alarming metrorrhagia. Galvanism five minutes. Large multilobar of six years' standing. After first operation effusions were dissipated. She could sleep comfortably in bed. Tumour arrested. Four more operations May 28, and physical examination showed the tumour sensibly reduced after the exhibitions. Health improved with control of hemorrhages.

CASE XX.—Mrs. R., Lancaster, Mass. Forty years. Long married, but childless. Interstitial fibroid existed five years, seriously affecting

general health. First application Nov. 10, 1874. No bad effects. Returned home, and came back to Lowell for more. Bore them well and again went home. March 27, 1875, she submitted again. Tumour *sensibly diminished*. General health decidedly improved.

CASE XXI.—Miss F., of Newburyport. Dr. Howe's patient. Treated Nov., 1874. Age thirty-eight. House servant. Single. Tumour six years' standing. Enormous growth. Cervix nodular. Disabled. Excessive and frequent metrorrhagias. Losing ground. Flowing bears no relation to menstruation. Feeble and emaciated. Forty-eight hours after first application a second was made followed by swelling of right lower limb. The third time free bleeding from one puncture. Eight applications in eight months. Reduction of tumour one-half. Nodules removed. Hemorrhages stopped. Patient reported herself lately. Tumour still diminished. Feels very well.

CASE XXII.—Mrs. W., Portsmouth, N. H. Widow. January, 1875. Age fifty. One child. Feeble health. Small fibroid tumours of several years' standing. Notwithstanding the small size the inconvenience has been very great. A sense of pressing down preventing her from inclining forward her body. Five operations. March 27, reports marked relief. Able to stoop, bend forward, and tie her shoes, also to sit erect in her chair, all of which she could not do before. For two years previous she had been unable to walk any considerable distance. *Now she walks easily without suffering*. General health improved. Tumour diminished somewhat.

CASE XXIII.—Miss ——. Age thirty-four. Gentlewoman. Patient of Dr. Luce Falmouth, Mass. 1874, Dec. 3. Small tumour has existed two years. Discomfort considerable. Battery applied. No bad effect. Dec. 5th second operation. 30th another operation. 1875, April 16, fourth application. Health improved. May 5th application. June 16th one electrode through vagina. Tumour diminished. At last accounts it had increased again. Patient on active duty in a school.

CASE XXIV.—Mrs. S. Patient of Dr. W. W. Jewett, of Chaumont, N. Y. 1874, June 4. Forty-eight years of age. Several children. Not much hemorrhage. Large fibroid multilobar. Growths increased one-third during the last six months. Galvanism this day. June 6th again. She returned home with her physician provided with means to perform the operation. 1875, Dec. 14, he writes: "She has had electricity eleven times, the tumour has reduced one-half in size. At the tenth operation I aspirated sixteen ounces of fluid from the upper part of the tumour." . . .

CASE XXV.—Miss Rhoda B. Ellis, West Hanover, Mass. Large fibroid. April, 1873. Forty-three years of age. Constitution impaired by loss of blood. Had undergone much treatment in vain. Feb., 1874, chloroformed and operated on. Later another, and followed by still more operations—all without avail. However, she writes Sept. 13, 1876: "For the last six weeks I have been improving, and the tumour has very remarkably diminished. It is very sudden and unexpected, but so certain has been the decrease that I could not forbear telling you of it." . . .

CASE XXVI.—Mrs. John L., Woburn, Mass. Thirty-eight years. No children. Noticed enlargement three or four years ago. Naturally a brunette. Very hard lobed abdominal and pelvic tumour with irregular surface. The series of applications produced vomiting and marked suffering. The patient was pronounced incurable, and a malignant case. 1877, March 28. Condition terrible. Great and constant abdominal pain only

relieved by large doses of morphia. Constant vomiting. In bed. States that tumour has not increased in size. Now it is soft and fluctuating—before it was hard and gritty. No hemorrhage. Measurement thirty-six inches. With Dr. Kimball's knowledge and consent I supplied her with my carbon and zinc battery ten pairs of plates, six inches by one inch, one-fourth and one-eighth inch thick. The fluid the same as described. Arrangement my own. Electrodes consisted of copper disks one and one-half inch in diameter, one-eighth inch thick. Advised St. Leon spring water for constipation.

April 12. Has faithfully used the battery. Measurement thirty-two and one-eighth inches. Morphia disused, because the pain was so much abated. Tumour harder and smaller.

27th. Has vomited but once or twice since the battery was applied. Measures thirty inches. Feels better.

May 5. Battery two hours daily. Thirty inches. Dr. W. S. Brown, of Stoneham, and Moore, of Woburn, saw her.

13th. Thirty-one inches. Been out doors.

July 10. Thirty-one inches. Diarrhoea. Mouth sore. Tongue clean. Severe chills. Abdominal pain not returned.

August. Discouraged. I gave up treatment.

Sept. Improved. *Oct.* She died. No autopsy.

The diminution in size and abolition of pain were sufficient rewards for the pains taken for her relief. The new battery spoken of certainly did well. It is quite portable, and is a good galvano-caustic battery, and it may and has answered for this operation.

CASE XXVII.—Miss Eliza C., single, 40 years; tumour very hard, 8 inches in diameter; existed since 1872. Three operations followed by an arrest of development for about two years; increase again; able to walk or stand without pain, which was impossible before operation; general health good; now on diet treatment.

CASE XXVIII.—Mrs. B., 35 years; married for several years, no children. June, 1874, sent by Dr. W. L. Atlee, of Philadelphia, for galvanism; very large interstitial fibro-cystic uterine growth. An abscess discharged a saucerful daily by several openings in the hypogastrium, and was connected with the peritoneal cavity. Ten quarts of ascitic fluid were removed by tapping; next day battery applied ten minutes; three days afterwards it was applied again. In July was again operated on; went to Nantucket and remained through the summer. September went to Lowell; tapped; next day galvanism; the day after returned home; five applications; tumour arrested. Patient insists on her improvement; menses regular.

Her physician, Dr. F. A. Paddock, of Pittsfield, Mass., writes: "Nov. 30th, Dec. 4th, 18th, and 29th operations: she was able to be out of the bed nearly every day throughout the winter; she gradually failed till May 1st, when she expired. *Autopsy.* Peritoneal cavity obliterated; fistula communicated with intestinal portion of abdomen; the anterior portion was filled with gelatinous cysts, with here and there serous cysts; behind was the uterus enlarged to the 4th month size. A large gelatinous cyst, filled with straw-coloured serous fluid, 16–17 quarts, appeared to be connected with the right side of the uterus; ovaries obliterated; it was not an encouraging case for galvanism."

CASE XXIX.—Miss Eliza C., Salem, Mass., school-teacher, 43 years of age; had tumour for several years; resembled a pregnant woman at full

term. March 2, 1874. Frequent and profuse hemorrhages; had given up hope of resuming her profession. March 3. Chloroform and ten-minute current. March 11. Second application; afterwards several times, with such relief that in April she resumed her school; the pain recurred; tumour evidently diminished; one application of galvanism removed *permanently* the pain. Subsequently the tumour diminished so much that an uninterested observer could detect no enlargement without palpation.

CASE XXX.—Mrs. N. L. Ellis, widow, 38 years of age; Feb. 26th, 1875. Trouble began in 1869 with hemorrhages; anæmic; os uteri reminds of incipient cancer; three applications, apparently without result. 1877, Aug. 21. Measures 36 inches; tumour soft and fluctuating; sound penetrated the uterus 7 inches. A small battery, described in Case XXXVI., was employed. 26th. 35 inches. 31st. 34 inches. Sept. 8th. Putting on flesh, 36½ inches. 10th. Tumour evidently fluctuating on pressure from fundus to pubis. 14th. Appetite ravenous. 25th. 34½ inches. 28th. Dr. Kimball pronounced the tumour decidedly diminished in size; in progress. Diet.

CASE XXXI.—Mrs. C., Dubuque, Iowa, 42 years of age; an invalid on account of a large fibroid. Dr. Washington L. Atlee, of Philadelphia, sent her to Dr. Kimball for the purpose of trying galvanism. It was dense and involved pretty much the whole uterus; increasing rapidly. Dec. 4th, 1874. Battery applied. Dec. 9th. Second trial; patient and friends insist that the tumour has diminished; nineteen applications were made at intervals of about one week each, when she returned home. Lately her sister reported her as attending to her duties as well as ever—tumour *much diminished*. It was added that she thought it was a duty to pursue this line of treatment judging from the success in this case.

CASE XXXII.—1873, Dec. 18th. Mrs. N. E. C., Woburn, 21 years of age; married 2½ years, no children; interstitial fibroid, central, dense, rising beyond the navel; blanched from hemorrhages; unfitted for employment; present Dr. Wolgamott, then of Woburn. Current four minutes under chloroform; in the course of a few days she declared the tumour diminished.

Feb. 18, 1874. Tumour softer and elastic; reduced one-half in size; second operation; electrodes evidently penetrated a cavity containing gas or fluid pus, as pus has escaped through the punctures by the electrodes.

May 31. The writer applied the battery; there was the same feeling of a central cavity. June 6th. Another profound effect; owing to her husband's increasing debility operations were suspended. June, 1875. Health good and tumour still lessened one-half; menses normal; no hemorrhages.

Dec. 19, 1876. Calls her health excellent.

1877, Aug. 21. Tumour increased; distinct; fluctuating; pain severe; profuse menses; gave chlorodynes, gallic acid; strict animal diet.

1878, Jan. Much improved; tumour lessened. In progress.

CASE XXXIII.—Miss Lucetta T., Stoneham, Mass., dressmaker, aged 40 years; large multilobar fibroid; fifteen years' existence; tumour rose beyond the umbilicus; dysmenorrhœa and menorrhagia; excessive pain in left hypogastrium every night, often required professional assistance; frequent micturition; her hold upon life was weak. Dr. William F. Stevens, of Stoneham, Mass., called my attention to her July 28th, 1874. Having made her will she submitted to the galvanism. Aug. 4th. Repeated. Relieved at once of pressure.

Nov. 24, 1874. Her clothes show two inches less size. Abdominal

cramps, to which she has been subject for twenty years, have disappeared; menses painless; sleep continuous; can lie on left side, which was impossible before; is working more than ever before. Two more operations; effect of the last quite severe.

July, 1876. Went to the Centennial; thence she visited the West. Rode over rough roads in springless wagons, suffering no inconvenience. Now enjoys good health. Tumour diminished now one-third.

CASE XXXIV.—1875, March 2. Mrs. Kate R., Dexter, Me., 45 years of age. Large abdominal, trilobed fibro-myoid existed at least eight years. Reduced very much by hemorrhages; pallid countenance and waxy look; disabled and dependent. Battery applied. Present Drs. Wheeler, Shackford, and Weeks, of Chelsea. On March 25 she measured 32 and 34 inches. Operation renewed. April 2d, another. She returned home and maintained herself.

1877, *Jan. 4.* Tumour increased and bad symptoms returned. Strongly urges the removal by section. 17th, another application. It was profound in its effects. Oct. 18th. Health excellent. Thought the tumour diminished once more.

CASE XXXV.—Miss Eliza K., East Boston, June 19, 1876, 44 years of age. Had large multilobar, very dense fibro-myoid tumour ten years. Abdominal, increasing dysmenorrhœa, menorrhagia, pressure and gnawing sensations; general health poor; $30\frac{1}{4}$ inches measurement. Sept. 16. Third operation; the venerable Dr. P. M. Crane, of East Boston, present; 29 inches. 1876, *Jan. 6.* Seventh and last. Resistance like that of cheese. Electrodes within half an inch of each other. The blood that flowed out on the groove of the carbon electrode coagulated into a firm clot. Drs. D. F. Lincoln and E. Chenery present. A few days later there was a deep furrow in the tumour, running in the track of the needles. Tumour diminished and softened; hemorrhage checked; health improved.

CASE XXXVI.—Miss C., 44 years of age. Oct. 30, 1875. Pelvic and abdominal fibro-myoid had existed a year or more; stony, hard, multilobar. July, 1876. Present Drs. F. A. Sawyer and L. H. Luce. Galvanism applied as above; electrodes in rectum and abdomen; current used too long; still constipation was relieved; lies all night in bed; distress "low down" relieved; sleep unbroken; both hands peeled of epidermis. Nov. 27. Daily chills and fever. Abdomen distended with a large fluctuating tumour. Felt in vagina; estimated that the pelvic tumour had diminished at least one-half. Dec. 1. Aspirated Oj of purulent chocolate-coloured fluid. Severe distress, syncope, and fainting followed. 2d. A ten-celled battery, copper and zinc, $4\frac{1}{2}$ inches by 2 inches, was put into three hours' daily use, per cutan for months. 8th. Dr. Kimball saw her; thought the cyst might be ovarian; prognosis decidedly bad. She continued to improve. 1877, *Jan. 25.* Battery causes pain, and is discontinued. Feb. 3. Cyst enlarged. 4th. Capillary matter passed via rectum; colour same as the aspirated fluid; odour that of rotten eggs; tumour lessened immediately. March 14. Feels very much better. April 28. Tumour still lessened. May 8. St. Leon spring water a success. Sept. 22. Pelvic portion increased. 1878, April 30. Quite well.

CASE XXXVII.—1876, Nov. 3. Mrs. S., Chelsea, Dr. Wheeler's patient, a woman of small stature; small, hard, multilobar fibro-myoid; painful and tender; menorrhagia, anæmia. At the operation blood clot was found on the carbon electrode. Pulse regular throughout. Present,

Drs. G. Kimball, S. W. Abbott, of Wakefield; Hanscom, of Somerville; Wheeler and Pratt, of Chelsea. 25th. Free from pain, and feels as well as ever she did. Tumour unchanged. Dec. 6. Inspection and palpation confirm her statement that she is smaller. 1877, Jan. 4. Another application. At last accounts doing well.

CASE XXXVIII.—Miss Caroline A. D., Marlboro', Mass. Dec. 29, 1876. 47 years old. Menorrhagia always. Tumour existed four years at least. Lobe in right groin large as an orange; uterus distended; os annular; tumour dense. This day galvanism three minutes; one electrode in vagina, one in abdomen. Present Drs. Kimball, Bixby, Hanscom, of Somerville, and F. F. Brown, of Reading. 1877, March 20. Abdominal lobe disappeared. There is now a cervix uteri three-fourths of an inch in length. Sept. 11. Cervix shorter than it was; no sign of abdominal portion. Doing well at last accounts.

CASE XXXIX.—1877, Feb. 4. Mrs. Cook, Groveland, Mass. Dense mobile abdominal fibroid, "large as a child's head." Four or five months pregnant. Pain and distress. Four applications; pain relieved; fibroid diminished. *At full term she was delivered of a living child!* This is the boldest procedure in these cases. It was performed on the ground that abortion would occur at any rate.

CASE XL.—1877, April 4. Mrs. Whitworth, Lowell, Mass. Abdominal pelvic, interstitial, solid fibroid tumour of the uterus, seven inches in diameter. She submitted to several applications of the battery in the usual way. She thought the tumour diminished. This, however, is certain, that, whereas she was a terrible sufferer requiring nearly constant medical attendance for relief, now she is as well as ever she was.

CASE XLI.—Mrs. E. L. P., patient of Dr. C. W. Hackett, of Maplewood. 1877, April 13, 35 years of age; married 14 years; childless. Oct. 1875 measured 21 inches; 1877, April 19, 32 inches. Nervous system completely deranged. Bed-ridden eighteen months. Hyperæsthesia and vaginismus; fainting, with defecation. Examined under ether. A trilobed dense growth attached to and incorporated with the posterior uterine wall, size of fist. Uterine cavity four inches deep. *Both electrodes introduced through the rectum.* Three-minute current; application followed by ambulation, painless defecation. May 3. Tumour apparently smaller. 22d. About the house. Sept. 6. Another operation. Tumour appeared smaller; it was soft and easily penetrated. Present Drs. Sullivan, of Malden; Bean, of Medford; and Hackett, of Brookline. Bad symptoms recurred, though another operation was practised.

CASE XLII.—1877, Aug. 23. Miss S., 24 years, vertical tumour. Dec. 1876. Dr. Wheeler, of Chelsea, saw her, with her physician, Dr. French, of Malden. Large interstitial, sub-serous multilobar fibroid. Tumour packs the pelvis; os dilated; per rectum large and spongy; pain chief cause of complaint. Present Drs. Vanderveer and W. H. Bailey, of Albany, N. Y.; Wheeler and Weeks, of Chelsea; French, of Malden; and Hackett, of Maplewood. Electrodes through abdomen and rectum. It should be stated that Dr. Wheeler had previously introduced small insulated needles connected with my small battery, with the result of reducing the œdema of vagina and pelvis. Sept. 6. He made a similar application. Oct. 15. The writer, in presence of others, made another deep application. Doing well at last accounts. Tumour diminished, and pain dissipated.

CASE XLIII.—1877, Oct. 23. Patient of Dr. C. W. Stevens, North Cambridge, Mass., and turned over to the writer by Dr. Kimball. Mary S., colored, servant, 43 years of age. Confined to bed since Aug. 8, 1877, on account of pain and weakness. Large abdominal pelvic and interstitial fibro-myoid. Tumour increasing in spite of ergotine. Dr. Stevens etherized, and Drs. Hildreth, of Cambridge, and Dorr, of Medford, assisted. Current ran $4\frac{1}{4}$ minutes. Nov. 3. Dr. S. says she has suffered very much. Right leg and thigh look “like a milk-leg.” This had been so before the operation. All insist the tumour is smaller. 5th. Abdomen diminished from 34 to 29 inches. Swelling on right leg subsided. Left leg swelled with its venæ comites. Profound shock after operation. Dec. 21. Considerable discharge from rectum of detritus. March, 1878. Pain and hemorrhage abolished. Disuse of morphia. Failing. April, 1878. Doing some housework. Removed to British provinces.

IV. Cases Relieved by the Operation.

CASE XLIV.—1874, Oct. 12. Mrs. F.; no children; 33 years of age. Tumour increasing rapidly in size for the last two months. Suffered from pain and distension all the time, but intensely for four or five days before the menses. Four operations; no impression on the tumour. The pain and suffering were relieved.

CASE XLV.—Mrs. Pollock, Worcester, 40 years old; no children. A hard movable fibroid occupied the pelvis and extended up to the umbilicus. Frequent hemorrhages; prostration and disability. The symptoms were relieved, but the tumour was not affected by several profound applications of the battery.

CASE XLVI.—Nov. 25, 1876. Mrs. H., coloured, 55 years; one child. Large multilobar fibroid of fifteen years' standing, dense and increasing. “Has bled like an ox.” Now running down very fast. Ascites, cauliflower ulceration of os uteri, profuse hemorrhages, debility, calcareous degeneration. In bed three weeks. Impression on writer was that of malignancy. Dr. H. O. Marcy, of Cambridge, her physician, *decidedly* thought not. In the presence of him, Drs. Holt, Clarke, and Edgerly, of Cambridge, galvanism was applied for only three minutes. Nov. 27. Found the patient getting out of bed. Ascites gone; vaginal flooding ceased. Dec. 13. Says the operation has done her “lots of good.” Is half-dressed in bed. 1877, Jan. 3. Repeated operation. 9th. Says she should be up and about if it was not such very cold weather. Feb. 16. Fistulæ at both punctures. No pain or discomfort. Patient about the house doing work. Great appetite. No vaginal hemorrhages. March 14. Fistulæ closed. Up and dressed. No ascites. Ten days ago hemorrhage relieved by injection of warm water. 27th. More hemorrhages. May 3. Drs. F. M. Dearborne, U. S. N., Lawton, of Springfield, Mass., and Marcy, present. One electrode readily penetrated the lower lobe; the other was directed into the uppermost lobe. It struck a substance solid like a stone. Force was used. It slipped, made exit through the skin, and penetrated the left middle finger of the writer. The lobe was calcareously degenerated. Another lobe lower down was more readily penetrated. 8th. Sitting and sewing in bed. Suffered much after operation. Husband refuses to have any more interference. Punctures healed. Death from recurrence of bad symptoms occurred within six months. It is proper to add that Dr. Marcy came in at last with the idea of malignancy.

V. Cases Cured by the Operation.

CASE XLVII.—Miss Fitts, of Haverhill, Mass., 34 years of age. April 22, 1873. Had a large globular and movable fibroid. She had given up, and “had gotten through with all the pangs of death.” Recent increase in size and suffering. Chloroform; three-minute current. June 23. Another application by the writer; five-minute. Present, Drs. Jas. R. Nichols and Chase, of Haverhill. Aug. 22. Last application by the writer. Present, Dr. Wm. Cogswell, of Bradford. Gradual diminution of tumour. Oct. 1. It has nearly disappeared. Afterwards it *entirely disappeared, and remains so.* (Reported in *Boston Med. and Surg. Journ.*, Jan 29, 1874.) Health restored.

CASE XLVIII.—1874, Oct. 17. Mrs. C., 23 years of age. Patient of Dr. Wm. Cogswell, of Bradford, Mass. Constant suffering from urinary incontinence, requiring a forcible pressure over pubis at each evacuation of the bladder. Tumour, interstitial and uterine, packed the vagina. Drs. Howe and Towle present. Chloroform. Both electrodes through the vagina. Nov. 3. Condition very satisfactory. Able to rest most of the night without being obliged to get up. *Examination showed a diminution of tumour one-half.* Instead of the peculiar hardness of a fibroid the diseased organ had become quite soft and flabby. Operation the second. Six weeks later the third operation took place. Patient able to visit neighbours on foot without difficulty. Subsequently the tumour entirely disappeared. Sad to say, health was not restored. It is reported she did not receive proper care and nursing, became bed-ridden, and died from exhaustion. As far as the galvanism was concerned, it was gratifying.

CASE XLIX.—1875, July 14. Mrs. Huse, Manchester, N. H., childless, 40 years of age. Fibro-cystic may be fibro-ovarian tumour. After several applications it gradually disappeared. Subsequently it reappeared. Twice she submitted again to galvanism. On proceeding to operate the third time no evidence whatever was found of the existence of the tumour. Jan. 30, 1877. General health still good. Tumour has not reappeared.

CASE L.—Mrs. Peebles, Manchester, N. H., 36 years of age. “Tumour hardish and punky, and as large as a bowl.” Unwell twice a month. Gave her two applications of galvanism, with an interval of three days. Current five minutes *each*; made a tremendous impression, causing severe pain, vomiting, and prostration. First application was through the abdominal walls; the second through the vagina. Before the first operation the uterine neck could not be found, but the finger came into contact with the fibroid. Tumour had diminished one-half. She could cross her lower limbs, which she could not do before. Oct. 1877. Some time after Dr. Kimball saw her incidentally, and found the tumour had entirely disappeared.

TREMONT TEMPLE, BOSTON, MASS., May, 1878.

ARTICLE IV.

THE OPERATION OF GASTRO-HYSTEROTOMY (TRUE CÆSAREAN SECTION)
VIEWED IN THE LIGHT OF AMERICAN EXPERIENCE AND SUCCESS, WITH
A RECORD OF CASES LARGELY OBTAINED BY CORRESPONDENCE. By
ROBERT P. HARRIS, M.D., Member of the Am. Philos. Soc.; Fellow of Coll.
of Physicians, Philadelphia; Member of Philadelphia Obstetrical Soc., etc.

HAVING largely increased our collection of American Casarean cases, since the appearance of the April number of this Journal, we continue the report as then contemplated, and present a new, and, in some respects, remarkable statistical series, covering almost the entire period embraced by the first record, and necessarily changing or modifying the general result, as to relative mortality, proportion of operations under exhaustion, etc. Additional information which we have since received renders it necessary, in order to be accurate, to make certain corrections and additions to reports of former cases, which will be found at the close of this paper.

The Multiple Casarean case reported by Dr. Nancrede in 1835, a Myth.
—In Dr. Nancrede's report of the first Gibson operation,¹ we find the following:—

“Finally, a friend of great intelligence and respectability, holding a respectable official position in Louisiana, now on a visit to this city, mentions as a fact, that the operation has been repeatedly and successfully performed in that country, but more especially within the last ten years, several times by Dr. Prevost, of Donaldsonville, Louisiana. My informant also states, that he was in the house on one occasion, while Dr. P. was performing the operation on a mulatto woman, for the sixth or seventh time, which, however, terminated fatally, though it had been successful on the same patient several times before.”

Finding that Dr. Nancrede never hunted up the record of this very remarkable case, and that there was no report of it in any French or American journal of the period, we began to hold the story in very great doubt, and determined, if possible, to clear up the mystery, although it may be imagined that the task undertaken was no simple one. It took several years before we could find a physician in Ascension Parish, who would act for us in making a local search among old inhabitants; but at last in Dr. John E. Duffel, whose grandfather had been a contemporary of Dr. Prevost, was found an active and interested co-worker. Through him we were also enabled to find Dr. Thomas Cottman, the successor of Dr. Prevost, now resident in New York, whose information has been of much value. It would be easy to fill several pages of this Journal with the correspondence and interviews relating to this one case, which are both curious and interesting; but it will be sufficient to state the conclusions arrived at, without giving all the points in the testimony.

There were no multiple series of operations as stated, but there was a woman at Donaldsonville upon whom Dr. Prevost did operate once, and

¹ Am. Journ. Med. Sci., 1835, vol. xvi. p. 347.

whose case, by some unaccountable process, became the basis of a plantation rumor, that she had been under the knife in the same way, no less than seven times. This tradition is still current among old coloured people, but with this difference from the account given to Dr. Nancrede by his friend ; the woman did not die after the seventh operation, but lived, and her child also, this being the only occasion in which any of her children lived. Now for the facts of the case, viz. :—

No. 73, 1831. Dr. François Prevost, operator, Donaldsonville, Ascension Parish, Louisiana. Communicated by Dr. Thomas Cottman, of New York, formerly of Donaldsonville ; aided by important local investigations made under Dr. John E. Duffel, of the same locality.

Caroline, black, aged about 29 or 30, slave of Madame Cadet Maurons, of Donaldsonville, in second labour ; first child a male, believed, from all accounts, to have been delivered by craniotomy, and perhaps evisceration ; from which we infer that she had a pelvis deformed by rickets, a very common disease in this part of the State. The incision was made in the left side of the abdomen, and a female child removed, to which he gave the name of “Césarine,” and stipulated that if it lived, it should be made free. The child was a mulatto, lived, and was given its freedom, grew up, married, and is believed to be living now in New Orleans. Caroline made a good recovery, and lived until her daughter grew up. She was not a mulatto, but black, pretty stout, and is described as “always walking straight.”

Dr. Cottman first saw her in 1832, when her child was about a year old, and examined the cicatrix in the side of her abdomen. She and her child were frequently seen by him and other witnesses at various times in after life. The sister of Caroline’s mistress is still living, and is positive that the woman had but the two children mentioned. Two slaves, formerly the property of Dr. Prevost, told separately the current traditional story about Caroline having been opened seven times, and one said that she had a child all cut to pieces in removal.

The informant of Dr. Nancrede probably received his impression through the prevalent belief. As Dr. Prevost was a graduate of the school of Paris, it is quite certain that he would have reported or talked about such a remarkable series of operations as was related by Dr. Nancrede forty-three years ago, as there is no satisfactorily authenticated case like it on record.

François Prevost, D. M. P., was born about the year 1764, at Pont-de-Cé, in the south of France ; graduated at Paris ; settled in St. Domingo ; was driven out by the revolution under Toussaint l’Ouverture, escaped to the French colony of “Louisianne,” and there died in 1842, of a partial paralysis of several years’ standing, at the age of 78. He was therefore about 67 years old, when he operated on Caroline Bellan (or Bellack), which was no doubt his last Cæsarean case. In 1832, he retired from much of his general practice, in favor of Dr. Thomas Cottman, to whom he subsequently left his instruments and library, and devoted his attention more particularly to gynaecology.

Donaldsonville appears to have been a centre of French medicine and

surgery in the days of Dr. Prevost, two of his contemporaries, St. Martin and Gourrier, both good surgeons, having been with Napoleon to Moscow ; besides whom there were Bouszoin, considered as at the head of his profession ; Tusson, Daboral, Arboneaux, Préval, Edward Duffel, Clements, etc.

Dr. Cottman says that Dr. Prevost pointed out to him in 1832, a little boy, six or seven years old, that he said he had brought into the world by the Cæsarean section. The boy was then living in the town, with a woman who kept a small shop, and as Dr. Cottman never saw his mother, it is probable that she died. He believes that she was the property of a German blacksmith by the name of Krohn. The boy lived to grow up, and was still alive a few years ago, having removed to Washington where he may be now.

Dr. Cottman, in letters of March 26th and April 17th inst., refers to two Cæsarean operations performed by Dr. Prevost on the same woman, with success to her and both children. He says, "I entertain no doubt of the fact, though it be not to my personal knowledge ; he was universally credited with it. . . . the operation was not deemed of great import in that day and locality of bold surgery and considerable scientific merit and attainment." He has more recently in person stated that the testimony was not traditional, and came in such a way that there could be no question of its truth.

We have been thus particular in matters of history, because we stated in the *American Journal of Obstetrics* that Louisiana was the pioneer in gastro-hysterotomy in this country ; "that the operation was performed a number of times with success in the early part of this century" prior to any of the cases we then reported ; and that the said State had probably furnished a large proportion of the Cæsarean operations of the United States.

As the country around Donaldsonville, including the town, reports 8 cases, and the rest of the State 7, it is probable that a full record would show a large number of operations, and a remarkable proportion of successes. As far as ascertained, we compute the cases at 15, with a saving of 11 women and 9 children.

No. 74, 1832.—Dr. Thomas Cottman, Ascension Parish, Louisiana, operator. Communicated by him March 28th, 1878. Woman black, aged 20, slave of Mrs. Stansbury, and in labour 50 hours. "Patsey" was first under the care of Drs. Thompson and Tusson, who tried to deliver her with the crotchet, but such was the deformity of the pelvis that the plan was abandoned, and Dr. Cottman called in to perform the Cæsarean operation. The child was now dead, and the woman much exhausted by the pain and fatigue of the long labour, but made a good recovery. Dr. Tusson is said to have sent a report of the case to a medical journal in Montpellier, France. The operation was performed in October, and the woman was alive in 1850 ; incision made in the linea alba. Dr. Cottman was also the operator in 1849 upon case No. 20 of our tabular record, and the woman, who was living in 1862, he thinks may still be alive.

No. 75, 1857.—Florence, Alabama, Dr. James W. Stewart, operator ; communicated by him March 4, 1878. We give this report more in

detail, as an example of the kind of cases that so often escape collection at the hand of a statistician, who is satisfied with giving simply published records, and is content to base his calculations of success and failure thereon.

Dr. Stewart operated with success in 1860, and reported the case, but like many others, did not place on record the unsuccessful one, because it did him no special credit, although no discredit could attach to him for having failed to save the woman; this properly belonging to the delaying accoucheur. We honor Dr. Stewart and many other surgeons for their prompt action in aiding us to present the records of their unsuccessful work, as these are quite as important in giving instruction as their opposites. We gain knowledge from bad cases as well as good; thus obtaining success by avoidance as much as imitation. The object of this paper is not simply to show how many women and children have been saved, and how many lost, but to demonstrate the difference between the results of early and late operations. When we compare one case with another, the very natural inquiry arises, Why was this woman saved? or, Why was she lost? as the case may be. Compare Dr. Gibson's operations with Dr. Stewart's, and we can easily see that the action of the accoucheurs had much to do with the success of the first, and failure of the second. The great wonder is, that cases like Dr. Stewart's in 1860, should ever succeed.

The subject of Dr. Stewart's operation in September, 1857, was a coloured woman of 19, a stout, healthy primipara, well formed, with the exception of a contracted pelvis, having a conjugate diameter of $1\frac{1}{4}$ inches. Gestation complete, pains strong and regular for 48 hours. Patient began to show signs of exhaustion, sick stomach, faintness when in a sitting position, pulse small, and beating 120 per minute. This state of things continued for 24 hours longer, when Dr. Stewart was sent for by the attending accoucheur with a request to bring his instruments for an operation. Craniotomy had not been performed.

Dr. Stewart found the woman in so exhausted a condition after 72 hours of labor, that he unhesitatingly pronounced the case as hopeless for the mother, and as the long-continued pressure had evidently destroyed the child, there was nothing to hope for from an operation. At the urgent request of the physician and friends, Dr. S. operated. There was but little loss of blood; but notwithstanding the use of frictions, artificial warmth, and stimulants, no reaction took place, and the woman died in 10 hours. Dr. Stewart, in closing his letter, says: "My decided opinion is, that had the operation been performed at an earlier period, the patient might have been saved." What possible reason could an accoucheur give for delay in a case with a conjugate diameter of one inch and a quarter? With such a measurement there ought to be no difficulty in deciding what is to be done, and at once, as there is only one thing that can be done, to save the life of the mother, child, or both.

No. 76, 1859.—Dr. J. C. Thompson, South Bloomfield, Franklin County, Ohio, operator. Mrs. S., aged 32, strong and muscular, and in labour for the third time. Was affected with recto-vaginal fistula, and extensive vaginal adhesions, almost occluding the passage, the lower part

of the rectum having sloughed off, and the upper being connected with the vagina, which served as its outlet. This fearful condition resulted from a labour three years before, in which twelve hours were consumed in cutting up and extracting the fœtus. The woman had been in labour about a day ("from one day until the next") when Dr. Thompson operated, and her pulse, after being dressed, was 115. She made a good recovery, but the child, which was hand-fed, died in a week, being affected with sore mouth, and irritable stomach and bowels, possibly somewhat due to its being in the month of July. (*Transactions, Ohio State Med. Soc.*, 1860, p. 63.)

No. 77, 1860.—New York City, Dr. T. Gaillard Thomas, operator. Case communicated by him, 1878. White woman, aged 28, afflicted with puerperal convulsions, coming on near full term, and continuing about 6 hours before Dr. Thomas saw her. Patient became moribund after twelfth or thirteenth convulsion; did not rally, and died before operation was ended. Child removed, dead, as a consequence of the convulsions in its mother.

No. 78, Jan. 1866.—Ascension Parish, Louisiana, Dr. Beauville Claverie, operator. Communicated through Dr. John E. Duffel, of Donaldsonville, La., 1878. Felicie, black, about 30 years old, deformed and very lame, primipara. Called in when she was *in extremis* from long labour. Child probably dead for several hours. Cæsarean operation performed early in the morning. Fœtus a large male. Woman died of shock in a few hours, having never rallied in the least after the operation.

No. 79, Nov. 1867.—New York City, Dr. Thomas C. Finnell, operator. Communicated by him, 1878. Subject, a German primipara, aged 26, with a contracted pelvis, from an exostosis near the promontory of the sacrum. Conjugate diameter 2 inches. Woman under care of an accoucheur, and in labour 3 days, when Dr. Finnell was called in. Child, a male, lived, and was given the name of "Macduff." Mother died in 48 hours, of exhaustion.

No. 80, 1868.—New York City, Dr. Thomas C. Finnell, operator. Communicated, 1878. Subject also a German primipara, with a bony tumor filling the cavity of the sacrum. Woman under two accoucheurs; in labour 3 days. Child removed, dead, having perished from uterine pressure. Mother died of exhaustion in 48 hours.

No. 81, 1869.—New York City, Dr. Thomas C. Finnell, operator. Communicated, 1878. Coloured girl, æt. 16, in labour 4 days; two accoucheurs in attendance; second in consultation. Dr. F. summoned to perform Cæsarean operation. Found her almost pulseless. Child dead on removal. Woman died in 24 hours, from hemorrhage and exhaustion.

Autopsy about 24 hours after death. About eight ounces of blood found in peritoneal cavity. Antero-posterior diameter of the superior strait $1\frac{1}{2}$ inches; transverse and oblique $3\frac{3}{8}$. Pelvis preserved in Bellevue Medical Museum. No uterine sutures employed in any of Dr. Finnell's three operations. They were all performed in the lower part of the city, in Thompson, Cherry, and Mulberry streets.

No. 82, June, 1871.—Ligonier, Indiana, Dr. D. W. C. Denny, operator. Woman white, primipara, wife of a farmer, and married twelve years; short and thickset, weighing about 140. Congenital occlusion of vagina partially relieved after marriage by a surgical operation. Was advised early in her pregnancy to submit to the induction of abortion, to avoid the necessity of performing the Cæsarean section; but declined, saying she would "run all risks."

Dr. Denny called in on morning of 27th; pains regular and unusually strong until 3 P. M., when membranes ruptured. Pains checked for the night at 10 P. M., by morphia, but returned actively at 6 A. M., when a convulsion of several minutes took place. Gastra-hysterotomy soon performed; no more eclampsia; fœtus well developed, and weighing 9 pounds; dead from uterine pressure; top of head coniform for about two inches in length.

Pulse of woman good for 3 days, when she was found to be rapidly sinking, and in a few hours died. "Her bed, bedding, and personal apparel had been scrupulously changed by officious female friends, contrary to *imperative orders and earnest entreaties*" of both the physicians in attendance. She is reported as not having had an alarming symptom before this, and Dr. Denny attributed her death to the "*kind meddling interference of neighbors.*" (*Indiana Jour. of Med.*, vol. ii., Nov. 1871, p. 310.)

No. 83, 1872.—South Bethlehem, Pennsylvania, Dr. Abram Stout, operator. Communicated by him, 1878. Subject a white woman, wife of Patrick B., about 30 or 35 years of age, with contracted pelvis; in labour two days, and under care of several physicians. Was much exhausted when Dr. Stout was called in. Child dead before operation. Not much blood lost. Woman stimulated, and fed with beef-tea, but died of exhaustion in a few hours. Dr. Stout repeats the often written regret of our surgeons, that he had not been called much earlier.

No. 84, 1874.—New York City, Dr. T. Gaillard Thomas, operator. Mrs. M., white, wife of a labourer, about 30, mother of five children; last two labours complicated, one by prolapsed funis, and the other by arm presentation. Existence of uterine fibroid diagnosed several months before by Dr. Thomas, and woman warned of the danger of pregnancy, and urged to report at once to her physician if it occurred, which she failed to do, as he was not summoned until she was in labour.

Had been several hours in labour when Dr. Thomas was called, and waters evacuated $5\frac{1}{2}$ hours; pains becoming feeble; funis hanging cold and pulseless between patient's thighs. Child dead some time. Pulse and temperature of woman good. Large, hard, fibrous tumour found attached low down along posterior and lateral walls of lower segment of uterus, closing cervix except anteriorly. Version and craniotomy found impracticable. Cæsarean section practised as a last resort. Uterine incision closed by silver-wire sutures.

Child removed in 30 minutes; patient dressed and in bed in 20; did well for 24 hours, when violent peritonitis set in, and she died in 3 days after the operation. (*Am. Jour. of Obstetrics*, New York, v. viii., Feb. 1876, p. 612.)

No. 85, 1874.—New Haven, Kentucky, Dr. J. N. McCormack, operator. Mrs. M. O'D., white, 44, fifth child, in labour fifteen days, thirteen of them under a midwife. During first week a young physician who was called in gave it as his opinion that she was not in labour. Dr. McC. found her much exhausted, with anxious countenance, feeble and frequent pulse, distended and tender abdomen, and some feeble labour pains. He found a hard and immovable fibroid tumour in the lower posterior portion of the neck of the uterus occluding the superior strait, except a small space in right anterior region, where finger could be passed to head of child, which was in a state of advanced decomposition. Craniotomy found impracticable. Abdominal section revealed a peritoneum covered

with recent lymph. Some hemorrhage from uterine vessels, but easily controlled. Woman rallied and appeared to do well for a few hours, then sank rapidly, and died in twenty-six hours from operation. She had suffered from indefinite uterine symptoms from the time of her last confinement, which increased in intensity as her pregnancy advanced.

This case is one of peculiar interest, as the fibroid tumour was in the most favourable locality for the uterine incision to be made with advantage. All fibroid Cæsarean cases in our country have been fatal, except No. 50, which was a pelvic growth; but this one of Dr. McCormack might possibly have been saved if the labour had existed but a few hours when the section was made. (*American Practitioner*, Dec. 1874, p. 341.)

No. 86, Jan. 31, 1875.—Lancaster, Pennsylvania, Dr. William R. Grove, operator. Hannah Lavegan, about 30, and a deformed dwarf, some three feet in height, with a curved spine. Child presented by right hip, which became impacted by delay, so that it could not be turned, or brought through the pelvis with the blunt hook, after three hours' effort. Labour commenced on Jan. 28th; membranes ruptured at 10 A. M.; woman up and about the hospital (Lancaster County) ward next day; pains renewed early on 30th; ceased making efforts to deliver *per vias naturales* at half-past two A. M. of 31st. Woman in delicate health, and exhausted by an irregular labour of three and a half days; operated on at half-past two P. M. of 31st; fetus a female, which, after much effort, was resuscitated, and lived; it was well formed and healthy. The woman died of exhaustion on February 2d, fifty-one hours after the operation. Conjugate diameter found by autopsy to measure three inches, and transverse five inches. (*Med. & Surg. Reporter*, Phila., vol. xxxii, 1875, p. 298.)

No. 87, 1875.—New Haven, Connecticut, Dr. Francis Bacon, operator. Communicated 1878 by Prof. Stephen G. Hubbard, M.D., of Yale College. Woman colored, primipara. 26, rachitic in childhood, conjugate diameter an inch and a half, breech presentation. In labour several days, feeble, exhausted, and pulse 136 at time of operation, child dead. Woman died in fifty-five hours, as might have been expected after so long delay. Autopsy revealed the existence of pus in the uterine incision, but no evidence of peritonitis.

No. 88, 1877.—Cincinnati, Ohio, Dr. George E. Walton, operator. White girl, 19, deformed from coxalgia, weight 78 pounds, open abscess in groin, bad cough, diarrhoea, and living in a low, miserable part of the city. Conjugate diameter $2\frac{1}{2}$, transverse $3\frac{1}{2}$, right pelvic wall straight. Forceps used with strong traction, but without avail; Cæsarean operation chosen over craniotomy, because considered the less dangerous in her feeble state of health. Labour well advanced when operation was performed; child removed alive and quite vigorous; free hemorrhage from lower edges of uterine wound for a few minutes; one silver wire suture inserted in middle of incision. Woman almost died on the table, but revived after operation and lived fifteen days. Died of exhaustion from general condition of health and want of proper attention. Child died in two days. (*The Clinic*, Feb. 23d, 1878, p. 85.)

No. 89, 1878.—Dr. Roland G. Curtin, Philadelphia, operator. Report read by him before Philadelphia Obstetrical Society, March 7th, 1878. Woman black, 20, a rachitic dwarf, but in good health, pelvis deformed; conjugate diameter 2 inches, transverse $3\frac{1}{2}$. Dr. Curtin not called until labour had existed eighteen hours; operation at State Hospital Feb. 8th,

after twenty-four hours of labour; condition considered as good, and membranes still unruptured. Considerable hemorrhage took place from the lower part of the uterine wound. Seven carbolized catgut sutures were inserted in the uterus to close the incision and arrest the hemorrhage, which were tied in treble knots. Pulse 84 an hour and a half after the operation. The hemorrhage having been soon controlled by the sutures, there was not much blood lost from the operation. Woman had scarcely any pain, and no vomiting; died on seventh day.

Autopsy twelve hours after death. Wounds unhealed, except outer part of abdominal, slightly; uterine wound open, and of a gangrenous appearance; slight peritonitis: a well-formed, dense, fibrinous clot found in the heart.

This is the fourth time the Cæsarean operation has been performed in Philadelphia, and the eighth, as far as known, in this State. It is the fifteenth in this country in which the uterus has been sewed up, and the first in which the sutures were of carbolized catgut, or any animal tissue, carbolized or plain. Deer-sinew ligatures were for forty years a favourite with the late Dr. Paul F. Eve, of Nashville; but they were used to secure arteries, and not to sew up wounds. The objection to animal sutures is that the knots are very insecure, becoming untied before union can take place.

The revival of the use of the uterine suture, as far as we have been able to ascertain, appears to have been due in great measure to the success of Dr. Godfroy, of Mayence, who, on March 27th, 1840, sewed up the uterus of a woman who had been two days in labour, by means of common needles and double waxed thread. For this act he was much condemned by his contemporaries; but the recovery of the woman recommended the innovation, and influenced others to imitate him.

We regard the use of uterine sutures as still in a measure experimental, and are not prepared to say that the danger is never increased by them. We are, however, satisfied of their value in cases of atony of the uterus after prolonged labour, and of hemorrhage from the cut sinuses; they also secure the uterus against leakage, resulting from post-partum relaxation of the organ reopening the wound. There have not been cases enough to test the relative success of operations with and without sutures; but the largely increased resort to them shows that the profession at home and abroad is inclined to regard the method with decided favour.

In looking over the records of old operations, in which success was in some instances very remarkable, we are inclined to ask what we have gained in the prevention or arrest of peritoneal inflammation since we abandoned the use of the lancet; and also what has been effected by *anæsthesia*, when we have to contend against an increased tendency to vomiting, and inertia of the uterus.

One thing is certain, the relative mortality has decidedly increased in the last twenty years over what it was prior to that time. In the early days of this operation in the United States, fully one-third of the cases

were delivered on the first day of labour; but in the last twenty years timely operations have been much more rarely performed, the proportion being about one in eight or nine. *We are most unaccountably retrograding in this respect, and losing by delay what possibly we have gained in improved methods of operating and treatment;* for, if anything has been satisfactorily demonstrated by our researches, it is the vital importance of an *early* resort to the knife, if it is to be used at all, with a reasonable hope of success.

A very careful examination of the whole subject satisfies us that, in the great majority of cases, the operation should be performed in a few hours after labour has commenced, or as soon as the uterus is sufficiently dilated to admit of the discharges having a ready exit after delivery. Taking the operations of Gibson, Scudday, Nettles, Merinar, McLelland, and Newton as types, we should say that a labour of six to twelve hours should be long enough as a general rule, if we hope to save both mother and child, which should be our aim in the operation, if at all possible.

Cases 75 and 84 are fair examples of the folly of delay which is so often fatal to women affected with deformed pelves. The stupidity of waiting hours, and even days, for a woman to accomplish anything for herself, with a conjugate of $1\frac{1}{4}$ or $1\frac{1}{2}$ inches, almost exceeds belief. No. 75 is particularly well marked as a case of unaccountable waiting for nature, with nothing to gain by it. For an ignorant plantation midwife to do this is not so much to be wondered at, for we have seen her counterpart in this city wait four days before calling in a physician; but for a graduate in medicine, with any pretension to knowledge, to do the same thing, and particularly in a large city where surgeons abound, is unaccountable in the extreme; such accoucheurs should quit the profession for the good of the community.

It is very unfortunate for the class of women most subject to pelvic deformities, that they should so often fall into the hands of ignorant midwives, or physicians of an inferior grade, when they require for their management the best talent of the land; if this was not the case, the Cæsarean operation would have been more frequent and successful than our statistics indicate. We recognize the danger of this form of delivery, but are not at all willing to measure the risk by the general result of all cases early and late, when we can show the special advantages of the former.

We have now presented reliable records of 89 operations of all grades, with a saving of 38 women; and 44 children delivered alive, of whom 38 were still living after some time. We have heard through correspondents of seven more cases, but satisfactory particulars have not yet reached us, except as to the results to mother and child. The whole collectively would number 96 operations, with a saving of $43\frac{3}{4}$ per cent. of the women and children.

It is hardly fair to charge upon the Cæsarean operation the results that have so often followed it. We admit the dangers of this form of obstetric surgery, but are not willing to make the operation answerable for the faults of midwives and uneducated accoucheurs. When we consider that 56 women were operated upon in a more or less exhausted state; that 3 were either moribund, or closely approaching it; that 5 were affected with convulsions; that only 20 were in a favourable condition; and that the tallest of 11 of the 89 was but four feet one inch in height, we are only amazed that so large a proportion escaped with their lives, and are led to the very natural inquiry, what would have been the result if all these women had been operated upon early, and under more favourable auspices?

What is wanted for the future is, that physicians should all be taught that in our own country the records of the past clearly set forth, that a series of timely operations on women in a fair condition of health will save from 70 to 75 per cent. of both mothers and children. This was our judgment six years ago, and has not been changed by an addition to our collection of cases of more than 50 per cent. during the interval.

Laparo-elytrotomy, as devised by Ritgen, Physick, and Baudelocque, and recently revived by T. Gaillard Thomas, of New York, and performed with success by him, and Alex. J. C. Skene, of Brooklyn, as a substitute for gastro-hysterotomy, has been attracting considerable attention, particularly in New York, where the old operation has had little to recommend it on the score of success, six out of seven women having died, and but two children being saved. By the sub-peritoneal operation, which avoids wounding either the peritoneum or uterus, much more favourable results have been obtained; three out of five women having been saved, and all of the children but one delivered alive; two subsequently died.

It is far from being a simple operation, as the cases of both operators will show, for in three of them the bladder was opened, although much care was taken to prevent it. It requires much more time, anatomical knowledge, and surgical skill, than the Cæsarean section, and is therefore not well adapted for general practice. In large cities, where skill can be commanded, and where the disposition to delay appears to be so common on the part of midwives and accoucheurs attending cases of deformed pelvis, it will be a valuable substitute, as proved by the experience of New York.

There have not been as yet cases enough to determine the full value of the operation, but it appears to be much safer *after exhaustion from long labour* than the Cæsarean section. If surgical aid should be called in early in a series of cases, and an equal number of each operation performed, we are not at all inclined to believe that the new method would have any marked advantage over the old on the score of safety to the mothers and children. But as women will call in ignorant aid, especially among the foreign residents of our large seaport towns, and delays will

occur, we believe it would be safer to operate upon them by laparolytrotomy, so far as we know by the cases reported. We should gladly hail any expedient which offers an increased safety to the mother and tends to diminish the necessity for craniotomy. As delay is begotten of ignorance, we are not sanguine enough to hope that any improvement can take place as long as we are unprotected by law against such pretenders as abound in our by-streets and practice on the credulity of the poor.

The experience of Philadelphia has been a remarkable one in cases of abdominal delivery, and would lead our obstetricians to favour the old operation. All the Cæsarean cases fell into the hands of educated accoucheurs; all were affected with deformity of the pelvis; all were operated upon before the membranes were ruptured; and all of the children (4) are now living. Two women were lost, but neither from acute peritonitis, as before explained. Two women were operated upon by Laparotomy after rupture of the uterus, and both were saved. Of nine Cæsarean cases in the whole State, four were favourable to the women.

In New York State and city there have been thirteen operations, and eleven deaths. Of the two saved, one operated on herself, and the other was performed in good season. In the last forty years every operation was fatal; all (11) were cases of *delay* but two, one of which died in the operation, and the other was the subject of a large uterine fibroid. This gives for the State a less percentage of women saved than we find in the English statistics of Dr. Radford.

In the balance of the United States, as far as ascertained, one-half of the women have been preserved. Ohio presents a record of 8 operations, with 6 recoveries, all published; but fails to find any unpublished cases, which inclines us to believe that there have been some not recorded which were possibly not so favourable; as in many States diligent search has discovered one or more such. If these are all, Ohio has a remarkable record; for of 5 women operated upon in conditions of more or less exhaustion, 4 lived, although but 1 child was saved. The 3 early cases saved all the children and 2 of the women, the one lost being a dwarf of 3 ft. 6. But for a persevering search, Louisiana would present 8 instead of 15; New York 8 instead of 13; Alabama 3 instead of 8; Pennsylvania 7 instead of 9, etc. We have found in all 31 unpublished Cæsarean cases.

The Martinique cases, given on page 334, last number, resulted favourably to the children, as was supposed. Mad. Hachard was 25 at first operation; had been the subject of rickets, and measured 3 ft. 10, in height; conjugate diameter computed at $1\frac{1}{2}$ in. Operations performed in good season.

General result.—North American Cæsarean operations, 103; women saved, 48; children delivered alive, 52.

Laparotomy, in cases of extra-uterine pregnancy, appears to have been performed in this country many years earlier than gastro-hysterotomy.

In 1759 Dr. Bard,¹ of New York, operated upon Mrs. Stagg, about two months after the delivery of a living child, and removed an extra-uterine fœtus, which had been dead about two years. Dr. Charles McKnight,² of New York, performed the same operation about 1792, on a woman in good health at the time, and removed a fœtus which she had carried twenty-two months. Dr. William Baynam,³ of Virginia, M. R. C. S., London, operated in 1791, and on another woman in 1799,⁴ children long dead. All these four women recovered.

Dr. Philip G. Prioleau's⁵ operation in Charleston, S. C., in 1803, terminated fatally in twenty-four days from abscess and septic poisoning, the fœtus having been long decomposed.

Prof. J. Augustine Smith,⁶ of New York, M. R. C. S., London, performed the operation with success in 1808, woman recovering.

Dr. John King,⁷ of Edisto Island, S. C., operated in 1816 by the post-uterine vaginal section, and removed a fœtus which lived; the woman recovered.

The general impression among medical journalists sixty years ago appears to have been that gastro-hysterotomy had not been performed in the United States up to that time, at least not in the New England or Middle States, and the most accessible regions south or west. This being the view then held, we are not likely to find any operations prior to those we have already reported.

As a commenter, who appears to be better skilled in writing than versed in medical history, has fallen into the error of supposing that the term "gastro-hysterotomy" was original with us, it may be well to state that it was introduced in 1816, by Dr. Gardien, one of the seventy-one contributors to the "*Dictionnaire des Sciences Médicales*," issued in Paris, 1812-22. He proposed this triple title for the Cæsarean operation on purely anatomical grounds, making a distinction between it and the erroneously applied French term, "Hysterotomie," which he placed at the head of another article, and confined, as it should be, to incisions of the uterus through the vagina. The surgical nomenclature of abdominal operations is so very defective, that a wisely devised distinction such as this, should have been universally adopted. To appreciate the defects, we have only to examine the various meanings of the term "*Gastrotomy*," as found in our medical periodicals.

Correction.—Through an error in the former article, the name of Frederick (Winckel) was made to take that of Ludwig, the successful

¹ Medical Repository, N. Y., vol. vii. p. 226.

² Memoirs Med. Soc., London, 1795, v. iv. p. 342.

³ New York Med. and Philos. Journ. and Rev., vol. i. p. 163.

⁴ Op. cit., p. 166.

⁵ Med. Repository, vol. vii. p. 221.

⁶ New York Med. and Philos. Journ. and Rev., vol. i. p. 54.

⁷ Med. Repository, 1817, p. 338.

Cæsarean operator of Gummersback, near Cologne, and the mistake was not recognized until too late for correction.

Case 1, of Tabular Record.—Dr. E. D. Bassett, in a letter written and published in 1857, says that the young quadroon girl recovered from her self-inflicted incision in 20 days, and that he saw her alive and well at service in Troy, six years afterwards.

The Monterey (Mexico) operation, mentioned on page 334, of the last number, was performed in September, 1877, by Drs. J. B. Mears, J. H. Mears, and a Mexican surgeon. The woman was long in labour, and the difficulty arose from the existence of sacral exostosis. The child was destroyed by an attempt at delivery under craniotomy, and had been dead twenty-four hours when the abdomen was opened. The wound healed by the first intention, and the woman sat up in fifteen days, and was about in twenty-five. The child, *minus* brain and parietal bones, weighed ten pounds. (*Med. and Surg. Reporter*, Phila., Oct. 27th, 1877, p. 328.)

Case 5 has a remarkable subsequent history, revealing an error in pelvic measurement which is by no means unique. Dr. Estep was a good surgical operator, but not so skilful as an obstetrician, in each of which capacities he was acting in the first operation. He gave the conjugate diameter of Mrs. Stull's pelvis at not more than two inches, and spoke very positively of the impossibility of delivering her *per vias naturales*.

In 1838, four years after the second operation, Mrs. S. placed herself under the care of Dr. Robertson, and engaged him to attend her in her confinement. In due time he was summoned, but arriving late, found that she had delivered herself of "healthy, vigorous twins." This led Dr. R. to examine her pelvis carefully, and he introduced his hand flat-wise antero-posteriorly between the sacrum and pubes, and computed the space at fully three and a half inches. As remarked recently by an able obstetrician in speaking of this case, "Pelvic measurements on the living are apt to prove fallacious." The *post-mortem* records of pelvic deformities will bear us out in this.

In 1841, while in the hands of a midwife, Mrs. Stull's uterus gave way along the line of the old cicatrix; Drs. Robertson and Carey were called in, the abdomen opened, and the child removed, but the woman died in thirty-six hours.¹ Dr. Carey examined the pelvis and stated that the conjugate and transverse diameters were "good," but that the depth of the pelvis posteriorly was less than usual.

We know that measuring the pelvis during labour in cases of deformity is no easy matter so far as attaining to accuracy is concerned. Three celebrated accoucheurs once computed the conjugate diameter in a hospital case at two and a third inches. The woman had been four days in labour under a midwife before her admission, and notwithstanding her pains were still very severe, the child was alive with a pulse of 145. It was decided to sacrifice the life of the fœtus for that of the mother, and craniotomy was performed. After the head was opened and the brain removed, traction was made by seizing the edge of the cranial opening with a pair of Meigs's craniotomy forceps, and drawing steadily upon them so

¹ Reported by Dr. Wm. Bowen, of Massillon, Ohio, in this Journal for Oct. 1843, p. 364.

as to elongate the head. In this way, a large child, and just dead, was removed, without cutting up either head or trunk, in a moderate time. We were present at the delivery, and cannot believe it possible that the child could have been drawn through the space given.

Cases 7-10.—Until quite recently, it was generally thought that the late Prof. Gibson performed the first Cæsarean operation in the United States that resulted in saving both mother and child; but we have in this paper shown that there were other cases in advance of Mrs. Raybold. We had the pleasure of seeing this remarkable woman on April 1st, and were glad to find her not only in good health, but looking several years younger than 69, which she recently reached. She is of slight frame, very erect, and measures 4 feet 8 inches; 2 inches more than in the published reports. As stated, the daughter (43) and son (40) are still living, and have four and two children respectively. The superior hygienic advantages enjoyed by the daughter over the mother, who was born in Ireland, have saved her from rickets, and any consequent parturient difficulty. Not one of the eight physicians present at the first operation, and but one of the six at the second, survives. It is remarkable that so small a woman should have survived two craniotomies and two Cæsarean sections, and lived to this time. The coolness, skill, and timely character of the operations of Dr. Gibson had much to do with her recovery; and her accoucheurs were prompt, and among the best of their day in any land.

713 LOCUST ST., May 16th, 1878.

ARTICLE V.

PELVIC AND ABDOMINAL ABSCESS. By CHARLES KELSEY, M.D., Assistant Demonstrator of Anatomy at the College of Physicians and Surgeons, New York.

SINCE the publication of the report of Dr. Parker's first operation for perityphlitis in 1866, supposed for some time to have been the first ever performed, the surgical treatment of this and allied forms of pelvic abscess by early incision has constantly grown in favour, and the notices of such operations have become so frequent, that a single one is now scarce worthy of publication. Among New York surgeons Sands, Wood, and Buck have each reported numerous successful ones, and the list has been increased by individual cases scattered through current literature, until the sum total is sufficiently large to place the desirability of this method of treatment in properly selected cases beyond the reach of discussion. For not every inflammation around the right iliac fossa needs the knife, and many of them have done very well in times gone by, and will in the future, under local antiphlogistic treatment.

Attempts, too, have been made from time to time to tabulate these cases, and draw from them some new facts, as to etiology, pathology, and

differential diagnosis, but with only partial success; for perityphlitis had been well studied, and its pathology well written, before these operations became common, and but little that is essential has been added to our knowledge in these particulars since the clinical lessons of Dupuytren and his accounts of *post-mortem* examinations.

Amongst recent writers, none have approached the subject in a more concise and scientific way than Bartholow (*American Journal Med. Sciences*, Oct. 1866), or W. T. Bull, in his prize inaugural thesis of the class of 1872, College of Physicians and Surgeons, New York. Bartholow's classification is the following:—

1. Abscess due to ulceration and perforation of the cæcum: the perforation being due (*a*) to the irritation of a foreign body; (*b*) to a perforating ulcer which may be situated either on the posterior surface and uncovered by peritoneum, or anteriorly and covered by peritoneum.

2. Abscess due to ulceration and perforation of the appendix: divided into (*a*) cases resulting from simple inflammation and abscess; and (*b*) those from a foreign body, which he estimates at three-quarters of the whole number of cases.

3. Abscess due to inflammation and suppuration of the sub-cæcal connective tissue.

This classification, with the further subdivisions which naturally suggest themselves, would seem to cover all cases of this disease properly connected with the cæcum or its appendix. For instance, to the simple varieties of ulceration must be added those due to typhoid fever and to the softening of tubercular deposits occurring in the appendix,¹ as well as in the cæcum itself; and to the whole museum of foreign bodies which have been found from time to time should be added the masses of hardened feces collecting in the caput coli, and acting as foreign bodies. Class 3 includes the cases of violence, the idiopathic inflammations, or those due to cold and strains; but we still have left the various collections of pus in this part which have no relation to the intestinal canal, and the exact diagnosis of which from true perityphlitis may at any time prove a matter of considerable difficulty; such as abscess following ulceration and perforation of the bladder,² acute inflammation of the right ovary with purulent pelvic effusion;³ psoas abscess, cancerous disease of abdominal or pelvic organs with purulent degeneration, disease of sacro-iliac articulation, abscesses after confinement, migration of pus from distant parts,⁴ etc.

The difficulty in diagnosis is one which Habershon⁵ has done something to elucidate; but from the nature of the case there must always be more

¹ Reynolds's Practice, vol. iii. Pathological Transactions, vol. xxvii. p. 127.

² Duplay. Archives Générales de Médecine, May, 1877.

³ Atlee. American Journal of Med. Sciences, July and October, 1877.

⁴ Buck. Abscess in the Lower Abdominal Cavity and its Parietes, 1876.

⁵ Guy's Hosp. Reports, 3d series, vol. xxii. 1877.

or less uncertainty. When a foreign body is found, the causation becomes apparent, though the point of origin of the inflammation may not; but when no such aid is given, it may still be impossible in any particular case to say more than that we have had to do with a pelvic abscess.

In my own practice during the past year, I have had three cases of deep-seated pelvic and abdominal abscess, differing as far as possible from each other in their cause, symptoms, and course, and presenting so many points of contrast, that I am led to hope they may be of general interest.

CASE I.—Boy, age 12; slight, and of delicate build, but generally well. Has had pain in abdomen for the last forty-eight hours. Pain on urination and defecation, and tenderness all over lower part of bowels, but without localization in any one point. Temp. 103° , pulse 130. Two soft evacuations from bowels yesterday.

Next day (third of disease) he “thought it hurt him more on the right than left side when he tried to stand up,” and there was some dulness in the right fossa, but no swelling. Has vomited his milk once.

4th day. Marked vesical tenesmus and flatulence, occasional vomiting; condition otherwise unchanged.

5th day. Temperature has continued to range between 101° in the morning and 103° in the afternoon. Passed a very restless night, and begins to show signs of suffering. There is flatulence, but not as much distension of the abdomen; vomiting and vesical tenesmus continue. Has had no chill. The tenderness is now confined to the right fossa, and is greatest at a point half way between the anterior superior spine and the pubes, and above a line running from one anterior superior spinous process to the other, where a slight tumefaction can be made out by careful palpation. No superficial redness. Bowels have not moved since the first day. On consultation with Drs. Sabine and Bullard, it was decided that an operation was not immediately indicated, and the same treatment, quinia, morphia, wine, and fluid diet was continued.

Next day (sixth of disease) there was a marked relief of all symptoms, less pain, less tenderness, four free fluid evacuations from the bowels in rapid succession, fall in temperature and pulse, appetite better, and has had a good night's sleep.

From the sixth to the thirteenth day there was little change. The bowels moved daily, but always with more or less pain, and the appetite and strength returned in a measure; so that he was able to leave his bed. But the temperature from day to day showed the same increase above the normal, never falling below 100° ; and the pain and tenderness did not diminish. For a day or two the parents had remarked a peculiar bubbling noise, which they heard at times at the seat of the tumour, and on the twelfth day a part of the dulness was found to have been replaced by clear tympanitic resonance, and the diagnosis of communication between the bowel and tumour was made. On the thirteenth day he had a very free fluid and offensive discharge from the bowels (which the parents said contained pus), followed by a marked fall in temperature and diminution of the pain; and for the next two days was comparatively comfortable.

16th day, evening. Complaining of great pain, rolling and tossing in bed, and screaming with agony. Found him lying on his right side, legs drawn up, sphincter ani relaxed, mucous membrane slightly prolapsed, and a

small stream of clear mucus flowing from his anus and staining the bed; tenesmus very great.

Had passed a small amount of well-formed feces during the morning, and had been sitting up enjoying his supposed convalescence.

Digital examination of rectum revealed a hard tumour pressing upon and almost closing it, situated on the anterior wall, to the right, and behind the prostate. Large doses of morphia given to quiet him through the night.

At my visit next morning he was more comfortable, and the tenesmus had in part ceased. Had passed nothing per rectum. On turning him on his back I was surprised to see what appeared to be a greatly distended bladder reaching nearly to the umbilicus, and plainly marked out on the abdominal wall. He had passed his water twice during the night, he said, in small quantity, and was not suffering from it at all then. Stupes over the bladder brought away four ounces of urine (by measure), and caused the entire disappearance of the visible tumour; the dulness and hardness to the touch still remained from the pubes half way to the umbilicus. Under ether he was catheterized and three or four ounces more urine was withdrawn, entirely emptying the bladder. By careful examination the following condition was then made out: A firm, hard tumour in the pelvis toward the right side, the upper edge of which could be felt by deep pressure about half way between the pubis and umbilicus and the lower surface by a finger in the rectum, which could just be passed through the partly occluded gut beyond the mass to its upper limit. The mass could not be made to fluctuate by this conjoined manipulation, and the intestine over it gave resonance on percussion. A medium-sized aspirator needle thrust into the mass through the abdominal wall gave us a pint of fetid, greenish pus, and the point of the instrument could easily be felt by the finger in the rectum, nothing but the wall of the bowel seeming to separate them.

After about five days he was again etherized, and a free incision made into the tumour from the rectum, by which it was thoroughly emptied. The end of the index finger passed through the incision into a large abscess cavity, the boundaries of which could not be made out. Healing rapid and complete. One year after the operation the boy is still perfectly well.

The points of interest in this case are the following:—

1st Causation: Nothing like a foreign body could be found, though thoroughly sought after during the whole course of the discharge. No injury.

2d. Position: The first symptoms—pain on urination and defecation—pointed plainly to a site between the bladder and rectum, with a peritonitis extending from this point. Afterwards the swelling approached nearer the surface, and was most prominent not at the usual place for a case of perityphlitis, but further towards the umbilicus.

It was this position of the tumour which kept us from operating at the time of the consultation, as I should have done had the matter seemed nearer the iliac fossa. But, rising as it seemed to do from deeper in the pelvis, and gradually coming up to the surface, carrying the peritoneum before it, the point was raised by Dr. Sabine whether in case of incision

we might not empty the pus into the peritoneal cavity; and whether by waiting a few days longer a union of the two layers of peritoneum might not take place, and the danger of peritonitis be thus diminished.

I have little doubt in my own mind that the pus was beneath the pelvic fascia, and I believe that in all cases of perityphlitis the matter will be found outside the peritoneal cavity, not merely shut off from it by adhesions with surrounding organs, but in the sub-peritoneal connective tissue. This is a point on which the light of *post-mortem* examinations is much needed; for though it is generally stated that an abscess arising from an ulceration at a point covered by peritoneum either bursts directly into the peritoneal cavity and causes death, or is shut off from it by adhesions and becomes encysted, there are few of these later cases actually recorded, if any. (?) On the contrary, where the exact location of the matter is stated, it will generally be found under the peritoneum. In the first case of this kind I ever saw, one in which the man died unrelieved by any attempt at surgical aid, we found, *post-mortem*, a date-stone in the appendix, and a collection of pus which had worked its way from the right iliac fossa directly across the pelvis behind the pubes to the left, raising the peritoneum before it in its course—a case which might in all probability have been saved by proper treatment. And in my own first case of operation,¹ by passing our fingers through the incision it seemed very evident that the abscess cavity was beneath the peritoneum, though it is a delicate point to decide under such circumstances. But I observe the same ground has recently been taken by Dr. Sands,² and I remember hearing the late Dr. Krakowicz express himself very strongly in the same way in the discussion of a paper by Dr. Gurdon Buck,³ also deceased, who held to the contrary. However, we have better testimony than opinion on this point. Duplay, in his *Archives Générales de Médecine*, May, 1877, in describing the *post-mortem* of a man who died of pelvic abscess subsequent to ulceration and perforation of the bladder, says:—

“By these two incisions a large cavity was opened, occupying all the hypogastric region, containing putrid gas and a small quantity of dark, brownish fluid. This cavity, with irregular walls, was limited in front by the abdominal muscles partly destroyed and reduced to a black gangrenous mass; behind and above by a thick membrane of brown colour, gray in spots, covered by thick and adherent pus, presenting an uneven softened surface. This membrane, which completely separated the purulent collection from the intestines and the absolutely healthy peritoneal cavity, appeared to be constituted by the peritoneum itself separated from the abdominal muscles.”

And Dupuytren,⁴ describing the *post-mortem* of a case of true perityphlitis from perforation of the appendix, says:—

“The skin was perforated by four openings, which communicated with each other, and opened *together into a large cavity or pouch situated between the mus-*

¹ N. Y. Medical Record, vol. ix. p. 511.

² N. Y. Med. Record, Jan. 19, 1878.

³ Transactions of N. Y. Acad. of Med., series 2d, vol. ii. 1876.

⁴ *Leçons Orales*, vol. iii. page 522. Ed. of 1839.

cles of the abdominal wall and the external surface of the peritoneum." Also on the next page, in a similar case: "The opening of the cadaver showed a large pouch having its seat in the cellular tissue surrounding the cæcum, with its burrowings following the direction of the psoas and iliacus muscles."

There are many such descriptions, but I do not remember meeting any where the pus was described as encysted in the cavity of the peritoneum. It seems astonishing, in fact, what an amount of pressure and tearing-up from its place the peritoneum will bear from a collection of pus beneath it without becoming perforated.

Another point of great interest in this case was the prominence given to the bladder by so small an amount of urine (8 oz.), causing it to rise over the tumour nearly up to the umbilicus; and the diagnostic value of the continued rise in temperature, when in every other respect the patient seemed on the point of recovery, should not be lost sight of.

CASE II.—Susan M., aged 45, widow. Three years ago patient was operated upon for ovarian tumour. The site of the incision is occupied by a hernia the size of a closed fist.

For two or three years past she has had more or less pain in the region of the stomach and liver, and has several times been jaundiced. She describes several attacks which might be attributed to the passage of a gall-stone, and has been treated under this diagnosis; but for some time past the pain has been almost constant; there has been occasional vomiting and constipation, but no jaundice or sudden exacerbations in the pain.

At the time of my seeing her she was suffering greatly, but could not point out the exact seat of the pain, which seemed to be general over the abdomen. She was in good flesh; bowels confined; urine normal; appetite poor; vomiting occasional; some fever, and occasional slight chills. Physical examination revealed nothing. She was put upon alkaline treatment under the probable diagnosis of impacted gall-stone.

During the next three weeks I saw her daily. The pain sometimes ceased for a day or two, and then was as bad as before for a longer or shorter period. There was never any jaundice, and careful examination of the abdomen failed to reveal anything abnormal; the liver seemed to be about the right size, and was not tender on pressure; but the fever and occasional chilly feelings remained, and she gradually lost strength and flesh. At the end of that time she was received into St. Luke's Hospital, and for the remainder of the history I am indebted to Dr. Beauvelt, the present house physician.

For the next month there was little change in the condition; but at the end of that time a tumour was discovered in the right side of the abdomen below the liver, large, deeply seated, and tender to pressure; and she seemed to be sinking under the prolonged fever and suffering. After another month the tumour had burst at the site of the old cicatrix in the median line, and was discharging a large quantity of pus daily. A probe introduced at this point passed a long distance upward in the sheath of the rectus muscle. For a while it seemed as though the patient might rally, but she gradually ran down again, and finally died, worn out by the suppuration, about five months from the time I first saw her.

Autopsy.—Liver not much changed in size; gall-bladder stuffed full of a mass of calculi, which came out as one piece, but were separated into twenty-five different stones by washing. This mass had caused ulceration

and perforation of the gall-bladder, which communicated with a large abscess cavity under the liver and close to the diaphragm; and the pus from this abscess had burrowed upward along the diaphragm to the substance of the rectus muscle, and along this to the point of opening in the cicatrix of the old ovariectomy, about half way between the symphysis pubis and the umbilicus.

The next case is interesting, not so much on account of any difficulty in diagnosis as of the treatment, which was very successful, and which I should be much inclined to repeat should a similar occasion arise. I can easily see, however, how such a case occurring on the right side instead of the left, might be very difficult to diagnosticate from an abscess connected with the cæcum, or appendix, especially in such a case as the one reported by Kiwisch when the cyst contained fifteen pints of pus.¹

CASE III.—Mlle. L., age 26. Has been a constant sufferer from dysmenorrhœa. Unwell one week before my first visit, and while so, took a bath in the surf. Found her suffering great pain in the region of the left ovary, with some fever. Ordered rest in bed, with the usual applications, and in the course of four days she was able to come to my office, and a vaginal examination was made, revealing retroversion, chronic endometritis, and parametritis, with tenderness on pressure and manipulation both of the uterus and left ovary.

Next day there was a return of all the acute symptoms, caused possibly by the examination or by over-exertion on her part, and for about three weeks she was confined to her bed with constant fever, pain on urination and defecation, inability to extend the left thigh, which she kept constantly flexed on the abdomen, and great tenderness over the left ovary.

At the end of this time a thorough examination was made under ether, and a large mass of inflammatory exudation around the ovary easily made out by the finger in vagina or rectum. Into this mass an aspiration needle was plunged through the abdominal wall with one finger in the vagina to steady the tumour. The needle entered with considerable difficulty, owing to the hardness of the tissue, but at length passed into an evident cavity, and from this about half an ounce of good pus without offensive odour was withdrawn. The needle was then forced onward into the vagina with the idea of using it as a director upon which to make a counter opening at this point; but this was found to be so difficult to accomplish satisfactorily that it was finally withdrawn, and the opening into the vagina postponed for a future operation if necessary.

The relief to all symptoms was very marked. The abscess cavity never again filled, and after a couple of months' treatment by rest and hot injections, a retroversion pessary was introduced, and the patient was able to resume her ordinary occupations without discomfort.

48 EAST 30TH STREET, NEW YORK.

¹ Tanner. Signs and Diseases of Pregnancy, p. 164.

ARTICLE VI.

CASE OF AN UNDESCRIBED FORM OF ATROPHY OF THE HAIR OF THE BEARD.¹ By LOUIS A. DUHRING, M.D., Professor of Skin Diseases in the University of Pennsylvania, Dermatologist to the Philadelphia Hospital, etc.

THE case that I am about to describe represents an interesting and, I think, new form of disease of the hair. It consists of a chronic disease of the hair of the beard, characterized by atrophy of the hair-bulb, and by splitting of the hair-substance, producing irritation of the follicles, and giving rise to disfigurement.

The subject is a physician, thirty-three years of age, of average height and proportions, with dark complexion and blackish hair. I first saw him one year ago. He stated that he was suffering with a singular disease of the beard, which gave him great mental worry and considerable discomfort. He had had it for some years, and although it had been vigorously treated, no benefit had resulted. He added that neither he nor the several physicians whom he had consulted had been able to arrive at a conclusion regarding the nature of the disease, but that by some it had been considered to be parasitic.

I found him of a highly nervous temperament, and exceedingly disturbed in mind about his condition. His general health was below the average. He was dyspeptic, and suffered with an irritable prostate gland. The hair of the scalp was cut quite close, and presented no peculiarities. Upon the upper lip he carried a long, narrow, brownish moustache, which, except that it was noticeably narrow, and had an irregular, broken upper border, appeared to be healthy. The rest of the face possessed about a week's growth of dark-brown, manifestly more or less diseased hair, which was nowhere abundant, and moreover inclined to grow in patches. The hair upon other regions of the body was normal. He gave the following account of the affection: It first manifested itself about seven years ago, upon either side of the chin, in the form of small irregular areas about the size of a dime. He was not at that time in the habit of shaving, but wore a full beard, which was thick, luxuriant, and perfect as regards the hair. He noticed that the hairs of the patches referred to became dry, brittle, and split up, and that they broke off here and there, leaving ragged extremities. Shaving of the whole face was now instituted, and kept up for a period, but it was noted that the disease still continued, and that it was very gradually encroaching on new territory. Three years ago it made its appearance around the upper border of the moustache on either side, where it has persisted, creeping downwards very slowly to its present line.

He states that he has observed that the effect of shaving is, upon the whole, beneficial. If daily shaving be practised, the skin and the hairs in time assume a healthier appearance. As soon, however, as the hairs are permitted to grow, the abnormal condition reappears. More or less irritation of the skin and slight scaliness of the affected regions are at all times present, but in a marked degree only after the beard has existed for some days. Occasionally the disturbance of the follicles is so great that small fol-

¹ Read before the American Dermatological Association, at its first annual meeting, at Niagara Falls, Sept. 1877.

licular papules and pustules form here and there. If the beard be allowed to grow for a fortnight, the hairs assume a stiff, brittle, split-up condition, the free ends showing brush-like extremities, while the skin becomes hyperæmic or inflamed and scaly. Sooner or later the hairs loosen, and may be easily pulled out, or in time drop out. Repeatedly of late the patient has resolved to permit the beard to grow indefinitely, for the purpose of further studying the course of the disease; but at the end of a fortnight the irritation and disfigurement have been so great that he has been compelled to abandon his determination. The disease, he states, is in a much more active condition now than it was a year or two since.

The subjective symptoms he describes as being very annoying, consisting of more or less itching and general irritation of the affected parts. They are decidedly worse when the beard is growing.

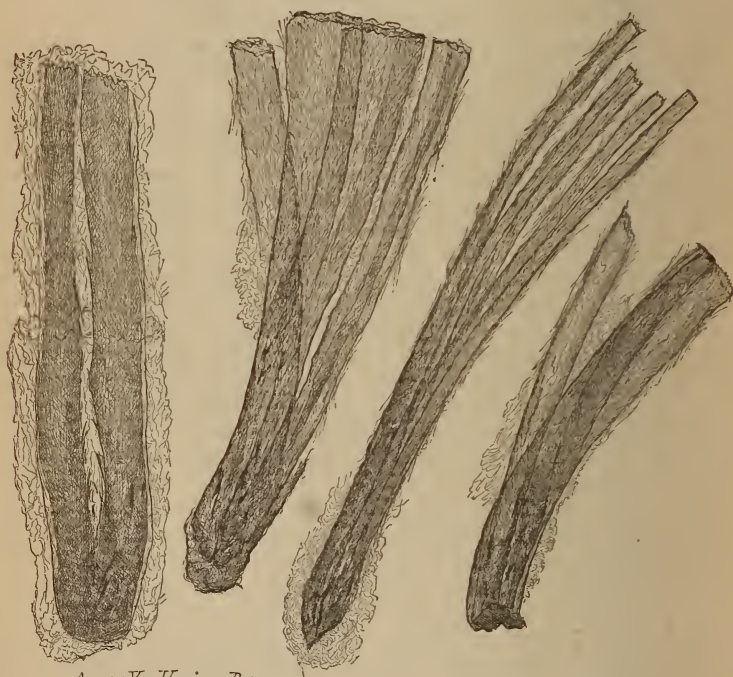
The present appearance of the disease may be described as follows: It will be remembered, as stated, that a week's growth of hair exists upon the chin, and that the moustache is of full length. The regions invaded are two indistinctly defined, irregularly ovalish areas, about as large as olives, on either side of the chin between the median line and the angle of the lower jaw. They come down over the chin quite symmetrically, almost joining at the median line. The upper lip is attacked in the form of two irregularly shaped, elongate patches, extending on either side from the lower border of the nares to the angles of the mouth; in other words, completely around the upper border of the moustache, which is in part destroyed. The remainder of the moustache is normal. The side whiskers as well as the hair of the neck are likewise unaffected. Around the outer border of the moustache the hairs are entirely wanting, the diseased areas having been recently depilated. The skin is slightly reddened and scaly, and has the appearance of being the seat of seborrhœa. As already stated, the moustache is unusually narrow and presents a broken, irregular upper outline. The patches upon the sides of the chin have a hyperæmic, scaly surface, and are partially bald, the hairs that remain being plainly diseased. Here and there are minute follicular papules and pustules. The free extremities of the hairs are split up into two or more parts, giving the hairs a ragged look. They are of irregular length and calibre; some are uncommonly thick, while others are remarkably thin and atrophied. One hair only is noted to proceed from a follicle. There is no swelling of the skin, but the surface is hyperæmic and slightly scaly, and, as upon the upper lip, resembles seborrhœa. The condition also bears some likeness to *tinea circinata* of this region, but not to *tinea sycosis*, for, as stated, there is no swelling of the tissues.

The hairs when seized with the forceps are found in some instances to be firmly seated in their follicles, and in other cases to be so loose that they may be readily extracted. Depilation is in no instance painful. Even the hairs which are securely lodged may be pulled out without causing the least pain. This has always been the case, and has been noted by the patient as being a singular feature of the disease. With some hairs depilation is difficult, the hairs breaking off leaving the roots within the follicles.

To the naked eye the extracted hairs are seen to vary greatly in appearance. They are from one to several lines in length. Some have a uniform diameter, several times greater than normal, while others throughout their length are unusually slender. They also vary in form, some being straight, others crooked. The bulbs are in almost all instances smaller than normal, and have a markedly contracted look. Not unfrequently the diameter

of the bulb and root is considerably less than that of the shaft. The shafts are either diminutive, in which case they are generally free of root-sheath; or, they are of large calibre and surrounded with adherent root-sheath.

The majority of the hairs show splitting into two, three, or more parts throughout their entire length. The extent of the splitting varies; in some hairs the substance is split up into a number of parts, or stalks, widely separated, while in other specimens the stalks hold together, so that the form of the hair is still preserved, although larger than normal. Many of the hairs look as though they might have been cleft with a delicate knife. In other cases the disintegration is in a less advanced stage, the hairs showing merely indications of splitting.



ARTHUR VAN HARLINGEN DEL.

Specimens of hair showing the several varieties of disease. 20 diameters.

Under the microscope the hairs exhibit still greater diversity of structure, as may be seen in the accompanying drawing. They are, in the first place, notable for their irregularity of form, scarcely two of them being alike. Atrophy of the bulbs and fission of the hair substance are the conspicuous features. In the majority of the specimens the bulbs are distinctly shrunken and atrophied, appearing as small contracted points or knobs. The hairs, as a rule, begin to fissure within the bulb, the separation of the parts taking place either at the bulb or at a variable distance beyond it. The hair structure is noted to divide very irregularly into two, three, four or more parts, which either adhere throughout the length of the hair, or diverge at once, and, in some cases, split again into other stalks. The splitting and branching may, I think, be quite appropriately compared to this process as it takes place in many elm trees, where the limbs are often

thrown off at no great distance from the roots. No uniformity is observed in the fission; some stalks spring directly from the bulb, others are formed by the division of a stalk. They vary as to number and size. The majority of hairs show from three to five stalks. Some are short and thick; others are long and slender. As a rule, they incline to diverge widely as the free extremity is approached, giving the hair somewhat the form and appearance of a feather brush. They either retain their original calibre throughout their length, or they gradually enlarge towards their free ends, in some instances to fully double the size they possess at their point of departure from the main structure. This is a striking and, at the same time, a curious feature of the disease, and is well shown in one of the drawings.

The cortical substance has either a dry, brittle look, as occurs in the atrophied, slender stalks, or it possesses a spongy, luxuriant appearance, as is seen in the thick, hypertrophied parts. The medulla is nowhere normal. It is present here and there, but in broken tracts. In many specimens nothing further than an irregular streak of pigment can be found, either at the bulb or in the shaft. The distribution of pigment is variable as to quantity and localization. In some hairs it is concentrated, as about the bulbs; in others it is noticeably wanting. The hairs vary in colour from yellowish to blackish.

The exterior surface of the hairs varies; in some cases it is smooth, in others dry, rough, broken, and ragged. Here and there are noticed jagged processes and spicules of partially detached filaments.

Concerning the treatment to which the disease has been subjected, it may be stated that various methods have been instituted and carried out more or less faithfully, including both internal and local remedies. Among the former, arsenic, strychnia, iron, iodide of potassium, and Donovan's solution may be mentioned, none of which exerted any influence on the affection. Locally, close shaving and depilation have been practised on several occasions, but never for a long period. During the time when the disease was regarded as being probably due to a vegetable parasite, parasiticides were freely employed, without benefit. The only remedies likely to prove of value, in my opinion, are long-continued shaving and depilation.

The disease is one of interest on account of its rarity and for the peculiar pathological changes. The symptoms, moreover, combine to render it both an annoying and a disfiguring affection. Regarding its pathology we learn from microscopic study that the morbid process takes its origin at the base of the bulb, and consequently manifests itself as soon as the hair commences to grow. The changes take place within the follicle. With the development of the hair occurs atrophy of the bulbs, followed by fission, and subsequently irregular growth of the hair-substance. The increase in the bulk of the hair, caused by the separation of its parts, renders it too large for the follicle, which becomes distended and more or less inflamed. The clinical symptoms are by this explanation satisfactorily accounted for. The most striking feature of the disease is found in the fact that while the bulbs are in a state of marked atrophy, the root and shaft show apparent hypertrophy, and in some cases this in a remarkable degree. The phenomenon admits of no explanation.

The theory of the parasitic nature of the affection need be mentioned merely to be disposed of as being entirely out of the question. No sign of any vegetable organism was found within the hair or in any of the epithelial cells of the epidermis or follicle. The microscopic examinations were conducted with much care, a large number of hairs, together with epithelial matter taken from the follicles and epidermis, having been viewed under both low and high powers. The specimens were obtained and examined on several occasions, and at intervals of months, with invariably the same result.

Splitting of the hair taking place without the follicle is by no means a rare condition, and may exist in all degrees of severity. It occurs in the long fine hairs of the scalp, and also less frequently in the shorter hairs of the beard. A case of simple splitting of the hair of the beard occurring in a gentleman of thirty with reddish hair, is at the present time under my observation. The hairs, upon being allowed to grow to any length, become dry and brittle, and split up at their free extremities into two or more parts, giving the beard a somewhat curly, bushy appearance.

In conclusion, it may be remarked that the disease which is the subject of this communication must be regarded as one of atrophy of the hair, and may be grouped with that singular and rare disease which was first described by Beigel under the name of "swelling and bursting of the hairs" (*Sitzb. d. k. Akad. d. W.* bd. xvii. p. 612, 1855). Kaposi, who has also met with the disease of Beigel, just referred to, proposes for it the name "trichorexis nodosa" (Hebra and Kaposi, *Diseases of the Skin*, New Syd. Soc. Trans., vol. iii. p. 244). The affection described by Devergie, and called by him "tricoptilosis" (*Annales de Derm. et de Syph.* No. i. 1871, 1872), is doubtless the same disease as the "swelling and bursting of the hairs" of Beigel. It differs in many particulars from the disease under consideration.

ARTICLE VII.

A GUNSHOT WOUND OF THE FACE, TOGETHER WITH THE DESCRIPTION OF
A SPLINT ADAPTED FOR COMPOUND FRACTURES OF THE UPPER JAW.
By W. F. MUHLENBERG, M.D., of Reading, Pa.

DURING the railroad riot that took place in Reading on July 23, 1877, E. H., aged 23, was shot through both cheeks, whilst slightly under the influence of liquor.

The hemorrhage, quite profuse at first, soon stopped after the patient had passed into a state of partial syncope. No large arteries were apparently injured, and by the next day the venous oozing had entirely ceased. The ball, probably a large sized minie, entered the right cheek at the intersection of a line, extending three inches horizontally from the ear, with another $2\frac{1}{2}$ inches long, drawn perpendicular to the outer edge of the

superciliary ridge. Its course, after passing through the anterior portion of the right malar bone, was directly through the face, and then out on the opposite side, at an almost identical position.

The damage to the bones of the face was excessive, and the face, to use the language of one of the physicians who saw it, "was nothing but a bag of bones." Every bone, except the inferior maxilla, was fractured, either in a simple or comminuted manner. The ethmoid, and probably the sphenoid, were also broken. Both superior maxillæ, detached completely from any bony union, protruded at least an inch in front of their normal position, and fell, over an inch, almost to the level of the chin, while the upper teeth protruded and projected far beyond and below the lower. The fracture, directly across the face, separated the orbital portions of both superior maxillæ from the bodies of the bones. A fracture in the roof of the mouth followed very closely the line of union, between the superior maxillary and palate bones, extending immediately in front of the second upper molar of the right side, through the roof of the mouth and floor of the nasal cavity, to a point before the last upper molar of the left side.

There was also an antero-posterior fracture in the roof of the mouth, completely separating both superior maxillæ. In addition, in the roof of the mouth there were a number of incomplete fractures and fissures.

The gap in the cheeks between the dislodged and orbital portions of both superior maxillæ was fully an inch wide, and disclosed, on palpation and probing, numerous fragments and spicula of bone. The space in the mouth between the palate and superior maxillary bones was large enough to admit the little finger. Both nasal bones were comminuted. The vomer was fractured, and quite a large portion was driven, by the force of the ball, through the cheek, and extracted, on the following day, at about the normal position of the left malar bone. The turbinated bones were also broken extensively.

Besides, the orbital portion of the superior maxilla of the left side was dislodged, and on the following day, after the removal of some impacted fragments of bones in the cheek, the entire anterior portion of the floor of the left orbit, together with the eye, sank down half an inch, although subsequently the level of the eye was raised to almost its normal position by the great effusion that resulted. The ethmoid bone was fractured, as was shown by the inspection of fragments subsequently removed. The lachrymal bone of the left side was dislodged, and forced down into the nasal cavity. The right malar bone was only slightly injured, while very little remained of the left malar bone, except its orbital portion. The inferior maxilla was not at all injured.

The face of the patient, subsequent to the injury, was more canine than human, as evidenced by the sinking in of the bridge of the nose, the protrusion and dependency of the upper lip and adjacent portion of the cheek, and the relative retraction of the chin and lower portion of the face.

The wound of entrance was about the size of the ball that produced it, while the wound of exit extended from the base of the left nostril and inner canthus of the left eye, in a Y shape, near to the left temple.

The different bones and fragments of bones lodged between the upper and lower portions of the superior maxillæ were firmly impacted, and required considerable force and time to remove them. Although, after their removal, the lower portion of the upper jaw hung apparently by only a very slight muscular adhesion, and allowed all necessary examinations, still after effusion took place, any examination of the mouth became difficult, and finally almost impossible.

The great difficulty which presented itself was, how to feed the patient. It was impossible for him to masticate any food, or even to draw liquid nourishment through a tube, not only because the mouth and nose were almost as one cavity, communicating freely with each other and the outside air, but also because any muscular action of the cheeks necessary for such an operation was prevented by their loss of power, and by the utter inability to keep the lips closed. He was fed by inserting a small gum tube into a tumblerful of liquid food, raised above the level of his mouth, starting a siphonic flow, and then insinuating the end of the tube between the two jaws, and allowing the fluid to trickle down his throat. This was comparatively easy for a short time, as the upper jaw could readily be raised a very short distance, so as to allow the tube to be inserted, but after the swelling and effusion had taken place was very difficult, as the tube had to be pushed upwards and then backwards before it could enter the cavity of the mouth, owing to the advanced and dependent position of the upper jaw, and its almost total immobility. However, this method of feeding was continued for six weeks, until, by the use of the splint, the upper jaw could again be raised. The patient suffered considerable pain from the passage of liquids, like brandy, beef tea, etc., over the raw surfaces of the mouth; but notwithstanding the discomfort, submitted patiently to all these annoyances.

The treatment used was the general one. The external wounds were covered with linen cloths, which were removed every fifteen minutes, night and day. These rags were dipped in ice-water, holding in solution, carbolic acid, laudanum, and lead-water. This mode of external treatment was continued for four days, when hot flaxseed poultices, renewed every half hour, were substituted for it, owing to the flabby and lifeless appearance of the wound. On consultation with a number of physicians of Reading, it was considered impossible to save the upper jaw, and its resection from the slight muscular attachments was agreed upon. Indeed, all the physicians who saw the patient gave an unfavourable prognosis as to the termination of the case.

However, on the morning fixed for the operation, the seventh day after the injury, the condition of the patient was entirely too precarious to admit or justify any operation, and then it was agreed to allow the reparative powers of nature full scope, and remove the sequestra of bone as they became loosened. On this day the patient was sinking very rapidly, but soon rallied, after a decided increase in the amount of stimulants and food given him. Unfortunately this low condition of the patient hindered us from securing his photograph, as for several weeks his wound was considered necessarily fatal by every physician who saw him. The patient during the first week consumed, besides the food he took, xij ounces of brandy per diem, but after this period used every day xx ounces of brandy, 3 quarts of milk, half a jar of Valentin's meat extract, a pint of beef-tea, and 3 or 4 eggs. About 1 grain of morphia sulphate was administered during the course of 24 hours, and a solution of the phosphates of iron, quinia, and strychnia was given from the time of the injury.

The splint shown in the drawing on page 97 was not applied until two weeks after the wound had been received, owing to the difficulty of devising any apparatus of the kind, and the time required in its manufacture. The kind assistance of Dr. T. Yardley Brown, a dentist of this city, and Mr. Van Reed, his student, not only in inventing the apparatus, but in

its entire manufacture, made the splint feasible. The measurements for the splint were made by Dr. Brown with a great deal of difficulty, as an ordinary pair of dividers could hardly be pushed in the mouth, and of course no wax model was practicable.

Within two weeks after the wound was received, the wound of entrance had closed, but in the subsequent week again broke open and discharged some spicula of bone.

The discharge of pus from the nose, mouth, and external wounds was excessive, and interfered to a certain extent with the feeding of the patient. He was forced to lie and sleep with his head thrown far forward, and to assume almost a sitting posture in bed, to prevent the pus and fragments of bone, discharged into the mouth, from running or falling down his throat.

Salicylic acid was applied topically to the mouth and external wound, to act as a disinfectant and correct the fœtor. In the mouth it caused considerable irritation with desquamation of the epithelium, and on this account a solution of chlorinated soda was substituted for it. A solution of boracic or carbolic acid was daily used to cleanse the wounds during the entire sickness. The mouth was syringed at least every hour during the day, and almost as frequently at night, for the mixture of pus, saliva and food formed quite concrete masses which would not flow out. After the wound of entrance had again broken open, warm carbolated water was injected through it into the face, at least three times a day. The injected fluid ran out of both nostrils, the mouth, and the external wound on the opposite side of the face. A large sinus at the inner canthus of the left eye was also used for injection, and through it large quantities of pus were discharged by the nose and mouth. A probe inserted at this opening fell by its own weight as far as the roof, and occasionally to the floor of the mouth, while it required only the slightest effort to pass a probe from the right cheek to the left nostril.

This plan of treatment was continued for two months, the dead pieces of bone being removed as fast as they appeared, when the patient was at last freed from any discharge of pieces of bone, or symptoms of osseous inflammation. Forty different pieces of bone, each larger than a pea, were removed from the face, nose, and mouth before convalescence was completed, and one piece of lead about as large as a buckshot was pried out of the left nostril. The effusion in the lids of the left eye and in the eye itself was excessive, but the œdema was readily lessened by an inverted action of the hypodermic syringe. A lump of œdematous flesh, as large as a walnut, was present under the same eye for nearly six months.

Within two months the upper jaw had been gradually forced up to its normal position, but owing to the extreme loss of bone, had been pressed back into the mouth further than was necessary. Unfortunately the adjustment of straps to the splint made it an easy matter for the nurses to alter the tension of the different straps if the patient complained of pain on one side of the face or the other.

From the time of the adjustment of the splint (August) to the latter end of November, the patient wore it continuously, and hardly ever objected to its presence in his mouth. The teeth of the upper jaw presented an irregular position, which perhaps might have been originally obviated if the adjustment of the straps of the splint had not been interfered with by the nurses. In November all the wounds had closed, except a small

communication in the mouth immediately behind the incisors, between the nose and mouth, which gave rise to considerable annoyance, as the food readily collected there.

Since the middle of December the patient has been wearing an elegant apparatus, contrived by Dr. T. Y. Brown, to remedy the false position of his upper teeth. Unfortunately the patient still continues wearing it, and as I have not seen him for a month, cannot secure a drawing of it. It is made of a silver plate, accurately moulded to the upper jaw, and retained in its position by a clamp around the last molar. A lever, in front of the same tooth, working in a joint, and having its upper end attached by a gum cord to the same tooth, presses forcibly upon the inner side of the last bicuspid, and gradually throws it out. A gum cord, fastened around the canine tooth of the right side, pulls it back, as the cord is attached to a small lever in the back part of the plate. Since the adaptation of this splint the position of the teeth has become nearly normal, and at some future day we may give an account of the amended mouth and splint.

Since the beginning of this year the patient has been able to use his upper jaw nearly as well as before the injury, although the union is not perfect. He can eat and chew any kind of food. The communication between the mouth and nose has entirely closed. The right side of the face is very slightly disfigured, and even the entire absence of the orbital portion of the superior maxilla of this side, which was removed piecemeal, is hardly noticeable. The hollow along the edge of the lower lid is not marked, still the removal of this bone has given rise to an epicanthus of the inner angle of the eye. There are a good many scars on the left side of the face, and vision is totally lost in the left eye.

With the exception that the lachrymal bone has been removed, the floor of the left orbit is entire; still it is all depressed some distance below its normal level.

The nose is considerably flattened, and pervious only on the one side. Vision in the right eye, hindered at first by the epicanthus, is now nearly as good as before the accident.

During the entire period of sickness there were no symptoms of any erysipelatos or pyæmic troubles.

Injuries of this kind are so rare that scarcely any allusion is made to them in the text-books.

The inferences we have drawn have been the following :—

No matter how severe the injury of the upper part of the face, owing to the excessive vascularity of the part, the reparative powers of nature are very decided, and the removal of any apparently sound pieces of bone seems unjustifiable. Good nursing is a *sine qua non*.

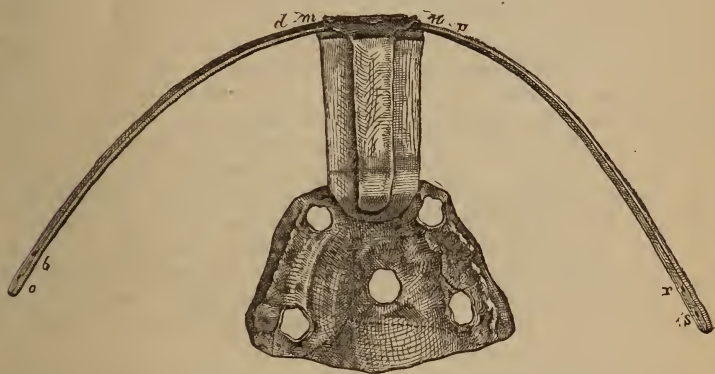
The subsequent union will probably be osseous.

The danger from erysipelas can be readily guarded against. Great attention must be paid to cleanliness, and antiseptics cannot be dispensed with.

The surgery of these parts of the body must be conservative, and must be varied according to the exigencies of each case.

The wood-cut of the splint represents a full view from behind. The cup-shaped body of this splint is made of silver, while the outer band is

of brass, and firmly welded to it by hard solder, so that the entire splint is and acts as a solid body. The splint on being applied acts as a rest for the teeth, which are prevented from being pressed out by the rim. The adjustment of the splint is easy. The patient should wear a night-cap made of some stout material. At *b o* and *r s* are firmly fastened gum bands which pass directly behind the head; at the same places, which are immediately in front of the ear, similar bands are attached, which run up over the temples, and at *d m* and *n p* gum bands are joined, which lead up on each side of the nose and pass to the front part of the head.



After the body of the splint is introduced into the mouth, presupposing a comminuted or bad fracture of the upper jaw, and after the readjustment of the fragments, the bands at *b o* and *r s*, which run behind the head, are tightened and pulled back, and of course draw back the entire splint and upper jaw, if there has been any anterior displacement of it. The bands running over the temples are then pinned or sewed fast to the night-cap, and elevate the posterior part of the band of the splint, which is outside the mouth, and naturally the posterior part of the body of the splint in the patient's mouth, as the splint is supposed to be one solid body. The bands running over the face, on each side of the nose, when fastened, serve to raise the anterior part of the splint. With these six straps we can then produce any effect we please, and can raise or loosen a single one, or a pair of straps, according to circumstances. The combined effect of them is to raise and retract the upper jaw, and this is very readily effected. By using the elastic straps, change in the tension can be readily made, and besides, the elastic nature of the India-rubber serves steadily to produce the effect desired. The great objection to this splint is the ease with which these straps can be tightened or loosened at the desire of the patient.

ARTICLE VIII.

CASE OF EXTIRPATION OF THE SCAPULA WITH A PORTION OF CLAVICLE AND ENTIRE ARM. By F. GUNDRUM, M.D., of Ionia, Michigan.

ON December 2, 1876, I was summoned to amputate an arm. Accompanied by Dr. S. V. Romig, who kindly volunteered to assist me, I repaired to the patient's house, and obtained the following history of the case :—

On December 10, 1876, the boy John was out hunting, when, while crossing a log, his gun accidentally discharged, and the load took effect in the arm between the shoulder- and elbow-joints. The wound was dressed with adhesive strips, and a roller bandage applied from the shoulder into the elbow-joint. No foreign bodies were extracted. After a few hours the hand began to swell and turn dark, and became very painful. The swelling increased, the colour grew darker, and during the night the boy became delirious and very feverish. Next morning the forearm was found to be intensely swollen, "black," and perfectly free from all pain, and the patient was apparently sinking rapidly. On the third day, at a second consultation, it was decided nothing could be done at present but to keep patient alive by nutritious food, etc. His physicians did not see him again. The patient was now attended by an old gentleman who had served as nurse in the German army many years ago. As the boy did not succumb to his injuries, after being abandoned for several days, his father asked to have me called in to see the case.

Present condition: The stench of the room is extremely offensive; patient is propped up with pillows; his general aspect is that of extreme exhaustion. He looks blanched and haggard; face cool and covered with large drops of perspiration; nose pinched. Respirations 40; pulse 130, and very gaseous and dicrotic. He still takes some nourishment. But for last few days his appetite has been failing.

His tongue does not look as we usually find it with above group of symptoms. It is moist and covered with a slight, white fur, but not sufficiently thick to prevent the tongue being seen through it. Bowels are moved daily; urine highly loaded. Faculties have been clear for several days. Since the fifth day, the wound had been dressed with common sweet oil.

The arm to eight inches above elbow, including fingers and hand, was intensely dark and hard, "mummified," and lay across patient's body. Above this on the anterior aspect and a little inwards the bone was bare and dead. At the inner side up to the axilla the tissues seemed to be in a soft sloughing mass. On the outer side the soft tissues were mummified to within four inches of the shoulder-joint, where the bone was bare of all soft tissues and periosteum, and dead. The capsular ligament was exposed on outer side and filled with greenish-looking pus. The sloughing process had not ceased here, but extended sufficiently to expose the acromial end of clavicle, the spine of the scapula, a small portion of supra-spinous fossa, and about half of scapula below spine, the infra-spinous fossa. In these parts the scapula was denuded of its periosteum. On the shoulder the line of demarcation was formed, and in most places the dead tissues had separated, but in the axilla and back there had been no effort at separation.

Wishing to find if there were any living tissues on inner side of humerus, with the aid of a pair of dressing forceps and scissors, I began to clear

the tissues away for about four or five inches below axilla. I soon came across a charge of shot, together with some clothing, and about the inner border of biceps, *i. e.* where the biceps should have been, I encountered something which gave the boy pain. It proved to be the brachial artery, still intact, but without pulsation; it was quite firm in consistence, and its walls were in apposition. After satisfying myself that its lumen was entirely obliterated, and no chance of hemorrhage, I divided it. The least traction on the vessel caused excruciating pain. The remaining tissues were now divided, and the bone sawed off at about four to five inches from its head. The operation was purposely made through dead tissues, as the loss of a few ounces of blood might have proved fatal to the patient, or the opening of sound tissue prove an avenue for pyæmic infection. He was now ordered the following treatment: *R.* Quinæ sulph. $\mathfrak{3j}$; tr. ferri chloridi, $\mathfrak{3ijss}$; vini Oporto, $\mathfrak{3viiss}$.—*Mix.* *Sig.*— $\mathfrak{3ss}$ once in four hours; also one ounce port wine every four hours, and to have the most nutritious and digestible food. As a local application the following lotion was ordered: *R.* Acid. carbol. $\mathfrak{3j}$; glycerinæ, $\mathfrak{3xv}$.—*Mix.* An ounce of this to be put into a pint of water and applied warm on soft linen cloths, and covered with oiled silk.

On the 27th I visited him and thought him beyond hope. The next day "his fever came up," and a homœopathic friend advised that my treatment was too stimulating; had brought up the boy's fever, and substituted aconite and belladonna solutions. Patient was clammy, gasping for breath; pulse 150, very feeble; with cough and stitch in left side; temp. not taken. Dr. Saur now visited the patient daily for me. The line of demarcation had formed and nearly all the dead tissue had sloughed away.

He was given brandy every few minutes, until he had somewhat rallied, and plenty of nourishment. The quinia and iron mixture were continued. From this time he improved slowly but steadily. All the dead tissue separated within ten days, and in three weeks he was walking around in the house.

On January 26th, accompanied by Dr. Romig, I visited the patient, carefully examined the injured limb, and made the following notes:—

The remaining portion of humerus was dead. Over the capsular ligament, on inner side, there were some small islands of granulation tissue. The end of the clavicle was necrosed for $1\frac{1}{2}$ inches. The greater part of supra-spinous fossa, with two-thirds of spine, and one-half of the infra-spinous fossa of scapula were denuded of periosteum. The inner angle and border for 1 to $1\frac{1}{2}$ inches were covered by skin. The lower angle and from about $2\frac{1}{2}$ to 3 inches above the external border were covered irregularly, though with its normal tissues. In the supra-spinous fossa the scapula was not only denuded of periosteum, but was also carious. As it seemed but very little of the scapula was in a healthy condition, and of no use if allowed to remain, I determined, with the full concurrence of Drs. Romig and Saur, to remove the scapula entire with the carious end of the clavicle, and remaining portion of dead humerus.

Operation.—The patient was given two ounces of French brandy, and when he felt its influence he was put upon an extension table, and Dr. Saur administered the ether.

My first incision extended from about the lower two-thirds of scapula, where the bone began to be covered with tissues to its inferior angle, and another divided the tissues over the superior angle a little above the spine. I now took Dr. Sayre's periosteal knife, hoping in this way to avoid ves-

sels and save all the blood I could, and peeled up the tissues, hugging the bone, taking along the periosteum wherever there was any. I thus freed the external border near the inferior angle and inner border. Coming now to the superior border and the supra-spinous fossa, I peeled out the tissues in the same way. I then made an incision over the clavicle as far as the necrosed tissues extended, and dissected them away carefully, so as to avoid wounding any important vessels. I now turned up the inner border and enucleated the scapula. I thus worked from below upwards until I reached the coracoid process; I then sawed off about one and three-fourths inches of the outer end of clavicle, and removed it with the scapula and humerus.

During the operation four vessels were ligated, and some eight or ten smaller ones twisted. When I had removed the shoulder blade, etc., I found I had not enough tegument to cover the enormous wound. There not being much time for reflection, as my patient looked more dead than alive, I rapidly dissected up the skin and superficial fascia sufficiently to slide them together to form an integumentary covering. The wound was washed out with carbolized water, and after closing with silk stitches was dressed with lint and a thick layer of cotton-wool.

The wound healed quickly, the patient was up in a week, and made an excellent and complete recovery.

From the periosteum that was peeled from the scapula at its lower angle, superior angle, and inner border, considerable bone formation was reproduced within eighteen months.

ARTICLE IX.

CASE OF EXCISION OF THE ENTIRE SCAPULA FOR CANCEROUS DISEASE.

RECOVERY OF THE PATIENT WITH A USEFUL ARM. By GEORGE A. PETERS, M.D., Attending Surgeon New York Hospital, New York.

CHARLES SMITH, England, æt. 42, cabinet-maker, was admitted into the New York Hospital January 3d, 1878, with the following history: Eighteen months ago he noticed slight stiffness in the movements of the right arm, accompanied by a moderate swelling of the corresponding shoulder. It caused him no pain, only a slight discomfort on certain motions of the shoulder-joint, or when he lay upon the affected side. These symptoms remained about the same until three months before admission, when he experienced more difficulty in using the arm, and was not able to work at his trade with his usual facility. At this time he also began to have severe pain, lasting for a few minutes if the shoulder were struck or pressed upon. Within the past three months the tumour has commenced to grow rapidly. General health good; no family history pointing towards cancer. Is not aware that he has ever overstrained or injured the arm. Examination on admission showed a tumour of the right shoulder situated upon and above the spine of the scapula. The tumour was not distinctly circumscribed, and had a somewhat elastic feel; was not movable. There were two points of tenderness, one upon the outer and the other upon the inner portion of the tumour; four and a half inches apart. The measure-

ments were as follows: On diseased side, vertical circumference around the axilla and over the highest point of the tumour was twenty inches. Measurement upon the sound side was seventeen inches. The skin over the surface of the tumour was congested, and the surface temperature was increased. Motion of the shoulder-joint not much impeded, though on circumduction the entire shoulder is raised. Aspirator needle, number 4, was inserted, drawing off only blood.

In consultation with my colleagues at the hospital, it was determined that the tumour was probably malignant, involving a portion of the scapula. It was also determined that the entire scapula should be removed rather than to leave any portion of it behind. The operation was performed January 11th, 1878. Patient was etherized. Carbolic spray was used, and all the details of Lister's antiseptic method were faithfully carried out. A horizontal incision through the skin was made over the centre of the tumour, along the spine of the scapula, from the acromion process to its superior angle. Some fibres of the trapezius and deltoid muscles were divided upon a director, thus exposing the surface of the tumour, which was found to involve the spine and supra-spinous fossa. A vertical incision was now carried from the middle of the transverse cut down to the inferior angle of scapula. The skin flaps were rapidly dissected up and reflected to either side. The posterior border of the scapula was then freed by dividing the trapezius, rhomboidei, and the levator anguli scapulae muscles, at their attachments to the bone, which was then lifted up and tilted forward. The subscapularis muscle was stripped from the under surface of the scapula by a few rapid sweeps of the knife, and allowed to drop down on the floor of the cavity. The anterior border of the scapula was now freed from its muscular attachments. The shoulder-joint was opened from behind and above, and completely disarticulated. In endeavouring to separate the acromion process at its articulation with the clavicle, it was found so soft from cancerous infiltration that the knife went directly through the bone. The distal piece, three-quarters of an inch in length, was subsequently removed. There was difficulty in reaching the coracoid process from the outside, so the almost detached scapula was forcibly raised and turned upon itself, when a few strokes of the knife released it from the ligament and muscle which bound it down.

Carbolized catgut ligatures were applied to the supra scapular, the posterior scapular, and the dorsalis scapular arteries. The subscapular artery was not divided. Several small bleeding points were secured in the same manner. Four drainage tubes were inserted: the edges of the wound were brought together and secured with carbolized catgut sutures, and the cavity injected with a solution of carbolic acid, one to thirty. Lister's dressing was applied, the arm carried to the side and crowded well up towards the acromial end of the clavicle. Forearm flexed and supported in a sling.

An hour or so after the operation, blood was found oozing freely through the dressings, which were loosened under the carbolic spray, and the sutures removed. The source of hemorrhage was found to be the supra-scapular artery, from which the ligature had slipped. The vessel was secured, the wound closed, and the dressings reapplied. Patient rallied well from the operation.

January 12. Twenty-four hours after the operation the dressings were removed. There was considerable sero-sanguineous discharge. A. M. Pulse 130, temp. 101. P. M. Pulse 134, temp. 101.6.

13th. Again dressed. Discharge no longer sanguineous. No inflamma-

tory redness. A.M. Pulse 130, temp. 99. P.M. Pulse 132, temp. 101.6.

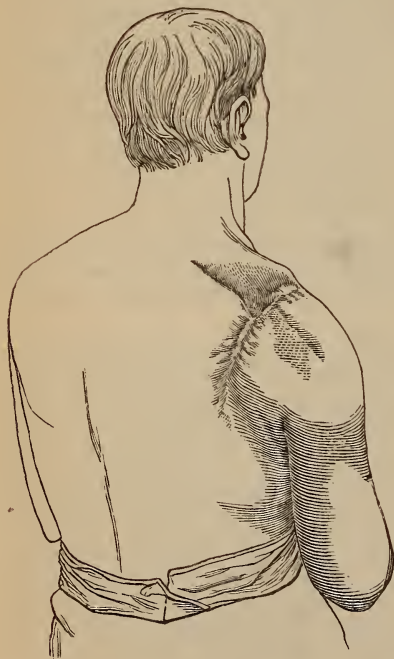
14th. Dressings again changed. A.M. Pulse 130, temp. 101.2. P.M. Pulse 126, temp. 100.6.

16th. Dressings changed. Discharge very moderate. No inflammatory redness. Sutures were all absorbed, and edges of wound consequently gaped somewhat.

17th. Dressings again changed. A.M. Pulse 114, temp. 100.4. P.M. Pulse 112, temp. 102.4.

This was the highest point of temperature reached during the progress of the case. The discharge from the wound, which was at no time very great, gradually diminished. Owing to the early melting away of the gut sutures, there was primary union only in a portion of the horizontal incision. The flaps were kept in position as well as possible by compresses and bandages, and the remainder of the cure was accomplished by granulation. The Lister dressings were continued until the 14th of February, when simple open dressings were applied to the small ulcer which remained. Up to February 4th the head of the humerus could be seen deep down in the superior angle of the wound, after which time it rapidly disappeared from view as the sinus leading to it filled up with granulations.

March 21. Patient was discharged cured. He was able to dress and undress himself somewhat awkwardly; to carry the right hand to the mouth, also behind the back, and could elevate the arm from the side to a considerable degree. The accompanying wood-cut will give a good idea of the comparatively slight deformity which remains after so extensive an excision.



Although on the whole well pleased with the Lister dressings, I found great difficulty, owing to their cumbrous thickness, in closely adapting the flaps during the process of healing. In a similar case I should use either carbolized silk, or even the silver wire suture, in preference to catgut.

After removal, the tumour was found to involve at least seven-eighths of the spine of the scapula; from and including the acromion process to the smooth triangular surface over which the trapezius

muscle glides. The supra-spinous fossa was slightly involved; the infra-spinous fossa was not invaded.

From a microscopic examination of slices from the tumour, it appeared to be a medullary carcinoma, originating probably in the spongy tissue of

the scapula, and undergoing rapid colloid degeneration. This diagnosis was verified by Dr. W. F. Bull and Dr. G. L. Peabody, both of whom examined the tumour.

It is not my intention to write a history of the operations involving a removal of the scapula, in part or entire, but simply to put this case on record as a contribution to the annals of conservative surgery. In the *American Journal of Medical Sciences* for October, 1868, may be found a carefully prepared paper by Dr. Stephen Rogers, of New York, in which he gives the histories of fifty-six operations, involving the loss of more or less of the scapula. Up to that time, and including Dr. Rogers's case, there had been "known to the history of surgery but nine cases of exsection of the entire scapula, with preservation of the arm." The records of whatever operations of this kind may have been done since the publication of Dr. Rogers's paper, are scattered through the pages of medical journals, and have not, in so far as I know, been tabulated.

In conclusion, I would state that I last saw my patient April 21st, 1878, at which time there appeared to be no signs of a return of the disease about the shoulder. There was also an increase in the power and extent of motion.

ARTICLE X.

SPHYGMOGRAPHIC EXPERIMENTS UPON A HUMAN BRAIN, EXPOSED BY AN OPENING IN THE CRANIUM. BY MARY PUTNAM JACOBI, M.D., OF NEW YORK.

JOSIE NOLAN, aged ten, a very healthy Irish boy, had, eighteen months previous to observation, fallen and fractured his skull in the right fronto-parietal region. According to the mother's account, he remained insensible for two hours; but recovered consciousness about two hours after the fragments of broken bone had been removed by the trepan. The mother insists that from that time the wound healed rapidly, and that the child presented no morbid symptoms, not even fever. The history is evidently imperfect. At present there is an opening in the cranial bones, $2\frac{1}{2}$ inches in the long diameter, $1\frac{1}{2}$ inches transversely. The opening is situated in the right fronto-parietal regions, about 2 inches distant from the sagittal suture, towards which the long diameter is inclined at an acute angle. The opening is covered by a membrane, much thicker at the sides near the bones than in the middle. It is to be presumed that the central portion consists exclusively of dura mater, which, near the bony margin, is thickened by the addition of the remains of periosteum. The centre of this membranous covering is habitually somewhat depressed below the level of the cranial bones, but rises and falls in regular pulsations synchronous with those of the radial artery. Ordinarily, the effect of respiration is only distinctly seen in the sphygmographic trace; but, on forced inspiration, the membranes are clearly seen to descend still further below the level of the bones, and on forced expiration to bulge above it.

Pressure upon the brain through these membranes causes no appreciable effect even on the pulse, and the boy, who has all the activity of his age, has, so far, never experienced the least inconvenience from this partial exposure of the brain. Under no circumstances, of digestion, exercise, or the influence of the various drugs administered during the experiment, was any change noticed in the colours of the membranes indicating increased vascularity in them. After exercise, they sometimes are bulging, but not always, and the effect of a temporary exertion rapidly disappears. When the boy is in a recumbent position, the level of the membranes is always higher than during the vertical position, whatever the level in the latter might be, or from whatever cause it had been effected.¹

The case offered a unique opportunity for the study of conditions affecting intra-cranial pressure. For this purpose, Mahomed's sphygmograph was adjusted to the head of the boy, in such a manner that the lever pad rested on the thin central portions of the membranes, the rest upon the bones, and steadied by an assistant. The adjustment was always made with the boy in a recumbent position, the head but slightly elevated upon a pillow.

Before interpreting the traces, it is necessary to notice in what respects these must be expected to differ from those obtained from the expansion of an artery. It is obvious that the pulsating encephalon in our case differs from the pulsating artery: 1st, by its greater proximity to the heart; 2d, by its vertical position over the heart; 3d, by the immensely greater surface receiving the shock of the cardiac systole, and through which must be disseminated the tidal wave of blood; 4th, by the greater volume of blood thrown against this surface; 5th, by the greater freedom allowed to the excursion of the part of the brain exposed; 6th, by the greater slowness with which its mass could collapse upon the blood wave. The trace from the artery corresponds to the movement of the entire mass of fluid contained in it. But while the pulsations of the encephalon are due exclusively to the influx of arterial blood, this fluid is only one of three which are moving simultaneously in the pulsating mass, the others being the venous blood and the cephalo-rachidian fluid. 7th, the final difference to be noticed in the much greater influence of respiration upon the amount of blood contained at a given moment in the brain, as compared with that contained at the same moment in the radial artery.

These various circumstances will each have a specific effect upon the sphygmographic trace. Thus, the first five peculiarities enumerated will combine to give a much greater amplitude to the curve, or an immense increase in the height of the ascension line.

Owing to the fourth circumstance, the height of the tidal wave above the base of the percussion stroke will be greater; for, according to Ma-

¹ Since writing this paper I have seen an article in the *Centralblatt* for 1877, describing analogous experiments upon a woman's brain exposed by carcinoma. The experiments did not test the influence of drugs; but the conclusions so far as regards the normal movements of the brain agree with mine. See *Centralblatt*, Mai 12, 1877. Giacomini u. Masso, Beweg. des Gehirns.

homed, "this height indicates the amount of blood forced into the arterial system at each ventricular systole."¹ From the sixth peculiarity, the tidal wave should be more sustained. On account of the third character, there should be few oscillations from secondary waves; thus, dicrotic and elasticity oscillations should be little marked. On the other hand, the multiplication of resistances offered in the brain by fulness of its veins, or tonic contraction of its arteries, should render obliquity of the percussion stroke, and even anacrotismus of the ascending line more frequent. Finally, from (seventh) the greater influence upon intra-cranial circulation exercised by the aspirating force of inspiration, a much greater depression should occur at the moment of inspiration in the *ligne d'ensemble*.

The foregoing characters are all exhibited by the traces. The encephalic expansions, as uninfluenced by medicines, are shown in Trace No. I.; also, in Trace No. VI. before the administration of atropia, and No. X. before coffee, and under the double influence of exercise and the digestion of a full meal.

Trace I.



Under pressure 5.

Description.—Trace No. I. exhibits a peculiarity not observable in Traces VI. and X.; it possesses an anacrotic elevation, or an elevation on the ascending line.²

This is described by Mendel³ as the character of the "pulsus tardus." In his schema, Landois succeeded in producing "anacrotismus" under one of three conditions, namely, when the exit opening of the schematic artery is narrowed; when the elasticity of its walls is diminished; and when, from increased volume of its contents, the internal tension is increased. Each of these conditions renders the distension of the tube by the systolic wave more difficult, hence prolongs the period of distension. Eulenberg shows that an anacrotic elevation may be obtained by compression of the artery beyond the point at which the sphygmograph is applied.

The other characters of this trace are, the well-developed tidal wave, or curve intervening between the percussion stroke and the aortic notch, and which, according to Mahomed, indicates the mass which has been thrown into the arteries by the cardiac systole; 2d, the deep inspiratory depres-

¹ Med. Times and Gaz., vol. i. 1872, p. 129.

² Elevation first studied experimentally by Landois. Die Lehre vom arterien Puls, Berlin, 1872.

³ Arch. Virch., Bd. 66, p. 260. See also Eulenberg, Arch. Virch., Bd. 45, 1869.

sion; 3d, the dirotic elevation is slight, but more marked than in other traces.

Interpretation.—These characters, together with the short but vertical percussion stroke, indicate increased cerebral resistance with a large volume of blood in active circulation. The larger the mass to be aspired into the thorax at inspiration, the more marked must be the depression in the line of cerebral expansions, or the *ligne d'ensemble* of the trace.¹ The slightly increased dirotism in the trace is to be referred to the state of the membranes, which were depressed, and flaccid, not tense or bulging. It was clear, therefore, that, notwithstanding the considerable tidal wave, the brain was not at the time distended. In another trace, taken when the membranes were tense and bulging, dirotism had entirely disappeared. It is to be inferred that the tonic resistance of the bloodvessels was at this time great. Such a condition would at once explain the great resistance offered to the cardiac systole, causing anacrotismus, and the diminished tension of the membranes, permitting slight dirotismus. The radial pulse showed high tension, and complete absence of dirotismus.

Hence, important corollary, we must conclude *that intracranial pressure* (such as would distend the membranes) *is not necessarily in proportion to the tension of the cerebral bloodvessels, or to the height of their tidal wave, but may be just the reverse.*

Trace II.



Pressure 5, two hours after 5 grs. of sulphate of quinia. Pulse 90.

Description.—Trace No. II. may be described as follows: Percussion stroke perfectly vertical and very high (by exact measurement one-third higher than in Trace No. X., the next highest observed). The angle between the percussion stroke and the line of descent of the preceding curve is very acute. Entire absence of anacrotismus. The systolic apex forms an acute angle, and is followed, not by a rounded curve, but by a horizontal, even slightly concave line. The tidal wave is very small. The line of descent is abrupt, and the dirotic elevation very near to its terminus. Finally, the inspiratory depression in the *ligne d'ensemble* is enormous.

¹ The percussion stroke is shorter during inspiration than during expiration. Since at this moment the cerebral resistance is diminished, this shortening must be due, not to increased resistance, but to diminished force of the heart. This diminution is caused by the "negative pressure" exercised on the heart during the expansion of the thorax, and thus is secured a real intermittence in the blood-pressure to which the brain is subjected.

The membranes bulged more at each cardiac systole than before the administration of the quinia, but were not tense.

Interpretation.—The height and vertical direction of the percussion stroke are not exclusively due to increased energy of the cardiac systole, since when this is obtained by brandy the percussion stroke is much lower (see Trace No. IV.). Hence, in addition to the effect on the heart, there must be diminution of the intra-cranial resistance. The acute angle of the systolic apex implies an instantaneous momentary collapse of the cerebral bloodvessels after their distension by the percussion stroke. From the smallness of the tidal wave we must conclude that little blood is retained in the arteries at any given time. But the prolonged horizontal line between the systolic apex and the summit of the tidal wave, implies a sustained tension of the arterial walls. The line resembles that observed in traces from atheromatous arteries. But the abrupt line of descent indicates powerful elastic contraction of the arteries, contrary to what is seen in atheroma.

Conclusion.—*By a tonic dose of quinia, the energy of the cardiac systole is increased; the tonus and elasticity of the walls of cerebral bloodvessels are also increased, so that the blood is forced rapidly on through the capillaries, thus diminishing the resistance to the cardiac systole. More blood is admitted to the brain, but the intra-cranial pressure is lessened.*

Trace III.



Two hours after 20 grs. of quinia. Pressure 5. Pulse 96. Temperature fallen one degree.
Membranes depressed.

Description of Trace III.—Percussion stroke vertical, but shorter than in Trace II. Systolic apex angle acute, and followed by descending instead of horizontal line. Tidal wave unequally developed, in some curves almost absent, in all very small, and far below the level of systolic apex.

Interpretation.—Diminished intra-cranial resistance to percussion stroke; nevertheless, small amount of blood thrown into brain, rapid and complete collapse of cerebral arteries.

Conclusion.—*Diminished energy of cardiac contractions, unfilled cerebral arteries, great diminution in intra-cranial pressure.*

It is important to notice that the radial pulse taken at this time exhibited a relatively much larger tidal wave and higher tension than was shown by these cerebral traces. We should infer therefore that the diminution of intra-cranial pressure was out of proportion to the general diminution of pressure in the arterial system connected with sedation of the heart.

Description of Trace IV.—Percussion stroke not quite vertical, much shorter than after quinia; systolic apex forming a right, instead of an

acute angle; tidal wave greatly developed; line of descent oblique and gradual; angle between it and the following percussion stroke rather wide; dirotism scarcely perceptible; inspiratory depressions not very marked, and much prolonged, comprising four curves, while the period of expiration comprises three.

Trace IV.



Pressure 5. After 3 drachms of brandy. Pulse 104. Membranes tense, bulging.

The membranes were tense, bulging, and affected by a peculiar heaving pulsation, not seen in any other case; the pulse was 104.

Interpretation.—Increased mass of blood in brain; increased resistance to percussion stroke dependent on this, and less than that which would be associated with contracted arteries;¹ (see Trace I.) slow collapse of arterial walls, notwithstanding rapid circulation; increased duration of inspiration; slow aspiration of blood from brain.

Conclusion is mainly expressed in the interpretation. The increased force of the heart is indicated by the radial pulse; its effect on the brain as shown in the trace, is partially compensated by the *increased intra-cranial resistance*. *The cerebral bloodvessels are dilated, implying diminished tonus of their walls; the intra-cranial pressure increased.*

Trace V.



After 5 gtt. tincture belladonna ter in die for four days, and 5 gtt. every three hours on fifth day.

Pulse 105. Pupils moderately dilated, membranes bulging, not tense in recumbent position.

Description of Trace V.—General resemblance to Trace IV. under brandy. Percussion stroke one-fifth higher than in Trace IV.; systolic apex a right or slightly obtuse angle; tidal wave developed about as much as with the brandy; line of descent gradual, without dirotism; absence of inspiratory depression; rise of entire *ligne d'ensemble*, as if from prolonged expiratory effort. All the characteristics of the trace were developed under a pressure of four ounces, as was not the case with brandy; but the percussion stroke was then higher than is represented in Trace V. The membranes did not bulge at all when the boy was vertical.

¹ Hence the percussion stroke, though short, is not anacrotic.

Interpretation and Conclusions.—Mass of blood in the brain increased about the same as after brandy; but intra-cranial pressure less (as shown by condition of membranes, and response to lower pressure of sphygmograph). *Expiration prolonged.*

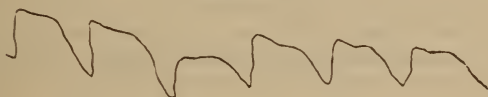
Remarks.—From the traces alone it is rather difficult to understand why the tension of the membranes should have been so great with the brandy, and so slight with the belladonna; the rapidity of the circulation was almost the same in the two cases (pulse 104 and 108). The difference probably depends on accelerated capillary circulation in the case of belladonna, and retard of the same after brandy.

Trace VI.



Before atropia, membranes depressed.

Trace VII.



30 minutes after, $\frac{1}{64}$ gr. atropia, subcutaneously. Pulse 120.

Description.—Trace VII. Half an hour after $\frac{1}{64}$ th gr. atropia shows, as compared with Trace VI., taken just before; that the percussion stroke is double the height, and more nearly vertical; the anacrotism has disappeared; the angle of the systolic apex rounded, but followed by descending instead of ascending line; tidal wave much diminished; dirotic elevation increased, and nearer by one-fifth to the percussion stroke—that is, the duration of the ventricular systole is one-fifth less. Inspiratory depression remains the same, slightly marked, and comprising a single curve. The membranes were raised, but neither tense nor bulging. The radial pulse had become dirotic.

Interpretation.—Relaxation of cerebral bloodvessels; consequent diminished intra-cranial resistance to percussion stroke; more rapid collapse of arterial walls; diminution in mass of blood retained in brain.

Conclusion.—Diminution of intra-cranial pressure, but increased amount of blood passing through brain in given time; on account of accelerated cardiac action and diminished resistance to it.

Description.—The peculiar effect produced by the drug is not perceptible in any individual trace alone, but in a comparison between the traces taken under moderate pressure (four and five ounces, Trace IX.), or under higher pressure (six ounces, Trace VIII.). In this the ascending stroke is anacrotic, in the others not. The tidal wave is also much less developed.

Interpretation.—The increase in pressure of the sphygmograph lever is transmitted to the cerebral arteries, so as to offer decidedly increased

resistance to the ventricular systole, and instead of developing the percussion stroke, breaks it. That such slight increase of pressure is able to cause anacrotismus, shows that *the force of this systole, i. e., of the heart's*

Trace VIII.



Pressure 6.

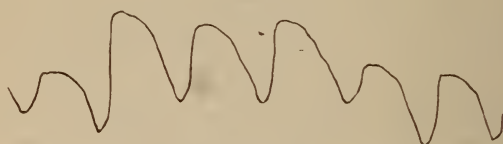
Trace IX.



2½ hours after ¼ gr. tartar emetic. No vomiting. Membranes apparently tense, bulging.
Pulse 112. Pressure 5.

action, has been weakened relatively; that the intra-cranial pressure is not only diminished, but is easily overcome by external pressure; in other words, that the walls of the arteries are relaxed. This peculiarity is not observed in any other trace, even that of the sedative dose of quinia, but is confined to the nauseating dose of tartar emetic. After vomiting, the intra-cranial pressure is raised, and resists the higher pressure of the sphygmograph.

Trace X.



Pressure 5. Before coffee, pulse 112. Membranes tense, bulging.

Trace XI.



Pressure, 5. Half an hour after 4 oz. strong infusion coffee. Membranes much depressed.
Pulse 112.

Description (Trace XI).—Absence of inspiratory depression, which has been marked in Trace X. Percussion stroke shortened to one-fifth the height, oblique, instead of vertical; higher under pressure 6 than 5. Diminution of tidal wave. The membranes were depressed, which had been bulging. The radial pulse remains the same in rapidity, and also in the form of the sphygmographic trace (not here given).

Interpretation.—From this last fact it is evident that the percussion stroke has not been shortened by weakening the force of the cardiac contraction. The shortening must, therefore, be due to an increased resistance in the brain. As there is not an increased mass of blood in the brain,

the resistance implies increased tonicity—increased contraction of blood-vessels. This tonicity is only overcome by greater external pressure; hence percussion stroke is more developed under pressure 6 than 5 (reverse of tartar emetic).

Conclusion.—*The amount of blood circulating in the brain is smaller, but it is brought to nerve tissues under increased pressure; hence assimilation of nutritive material should be increased in rapidity, if lessened in quantity. The intra-cranial pressure, on the whole, i. e., against the membranes, is diminished.*

Trace XII.



Pressure 4. Three hours after twenty grains of bromide of potassium.

Trace XIII.



Pressure 5. Pulse 76; membranes depressed below cranial level.

Description.—Great development of tidal wave, perceptible under all pressures. At pressure 4, percussion stroke so oblique as to merge into tidal wave. Trace resembles that from an aneurismal tumour.¹ Under pressure 5, percussion stroke sometimes vertical, sometimes oblique. Line of descent prolonged and gradual, without trace of direction.

Interpretation.—The trace must be considered in connection with the facts, that the membranes had become depressed, and the tidal wave of the radial pulse extremely small under the influence of the bromide. It is to be inferred, therefore, that the large tidal wave in the cerebral trace does not depend upon an unusual amount of blood thrown into, or contained in, the brain, but upon unusual obstacles to its passage out of the brain. This implies a contraction of the smallest bloodvessels and capillaries, the larger remaining the same, and thus offering no other obstacle to the ventricular systole than the prolonged retention of blood in them; the latter causing increased lateral pressure, identical with that of a large tidal wave.

Conclusion.—*The intra-cranial pressure, on the whole, i. e., against the membranes, is diminished; but the brain tissue is subjected to a mechanical pressure from fulness of the vascular canals before the point where they begin to be nutritive, and because of relative exclusion of the blood from the latter.*

Remarks.—The descriptions of the traces of coffee and bromide read a good deal alike, except in regard to the tidal wave; but the traces are

¹ See trace given by Mahomed, Medical Times and Gazette, 1873, p. 222.

conspicuously different. The difference probably depends on the different rate of the circulation, on the different direct action of the drugs on the nerve tissues, and on the exercise of lateral pressure in the *nutritive* bloodvessels in the case of the coffee; in the canals leading to them, in the case of the bromide. In the case of the brandy an increased tidal wave was interpreted as evidence of dilatation of cerebral bloodvessels, because of the visible increase in the tension of the cerebral membranes and the state of the radial pulse which coexisted.

The characteristic trace of the bromide was not developed until three hours after its administration. It was most characteristic at a low pressure (4). It is not believed that the whole, or even the greater part of the physiological action of bromide of potassium can be explained by this effect upon the cerebral bloodvessels.

To what extent the conclusions, drawn from these observations, are in accordance with existing theories, may be considered on another occasion. On this, we content ourselves with registering the facts.

ARTICLE XI.

A CONTRIBUTION TO THE PATHOLOGY OF ORBITAL CELLULITIS. By CHARLES STEDMAN BULL, A.M., M.D., Surgeon to the New York Eye Infirmary and to Charity Hospital.

THOUGH cases of inflammation of the tissues of the orbit are from time to time published, and though orbital cellulitis cannot be justly considered a rare disease, yet the state of our knowledge upon its pathology and etiology is still unsatisfactory. In not a few cases the obscurity which rests upon its origin needs clearing up, and the course sometimes pursued by the inflammatory process requires explanation. Yet when we come to consider the orbit more closely, it would seem as if no mystery should be attached to the subject. The large amount of adipose and connective tissue, and the numerous vessels and nerves, would naturally form a region in which an inflammatory process would easily rise and rapidly spread. In the literature of the subject the most various causes are enumerated their number being almost legion. Among the most important are acute infectious diseases, as typhus, scarlatina, etc.; facial erysipelas, foreign bodies in the orbit, wounds of various kinds; and among these may be included operations upon the eyeball, or in its immediate vicinity. Thus severe orbital cellulitis has been known to follow an operation for squint, done in the correct manner and by a very skilled hand. Sonnenburg reports such a case, in which, however, the inflammation ended in resolution and did not go on to suppuration. Laqueur has observed cellulitis to follow enucleation of the eyeball.

But sometimes cases occur without any known cause for the inflammation. Sonnenburg (*Deutsche Zeitsch. für Chirurgie*, 1877) reports two such cases, in both of which the eyes were completely destroyed. He seems, however, inclined to compare them with similar phlegmonous processes occurring in other parts of the body, and due to some infection or blood poisoning. The symptoms of orbital cellulitis are always characteristic, and with ordinary care no difficulty in diagnosis exists. The disease often begins with a chill, followed by high fever, or there may be no chill, but simply a general feeling of malaise. An intense, deep-seated pain is then felt in the orbit, injection and chemosis of the ocular conjunctiva make their appearance, the eyelids begin to swell and grow red; and the same process going on in the orbit behind the eyeball, the latter begins to protrude, and we have exophthalmus. As the inflammation becomes more intense, and the prominence of the eyeball more marked, its movements become more or less completely impeded, and finally the eye is absolutely motionless. Before this, however, the eye itself is involved in the destructive inflammation. Owing to the great infiltration and chemosis of the ocular conjunctiva, the cornea is surrounded by a tense wall in which it lies sunken, its nutrition is interfered with or entirely interrupted, it rapidly becomes opaque, and soon sloughs away entirely or in part. From the cornea the destructive process extends to the deeper tissues of the eyeball, and it is not uncommon to have a panophthalmitis as the result. If the cornea remains transparent, yet is the danger to the eye not passed by; for the optic nerve becomes constricted behind the eyeball by the mass of exudation thrown out into the orbital tissue, and the result is again disastrous to vision. Or again, if neither of these results occur, the eyeball still runs a third danger from suppurative panophthalmitis, starting up directly in the eye from interruption to its blood-supply by the mass of exudative material surrounding it in the orbit.

As before remarked, Sonnenburg advances the view that real inflammation of the orbital adipose tissue is connected with inflammatory processes in the face, pharynx, and posterior nares, just as phlegmonous processes in the neck are thus connected. Without denying the justice of these views, I have never seen a case in which it was necessary to go so far for a cause. In the cases to be detailed, there was no blood poisoning of any kind, and yet in all of them the causation was somewhat obscure.

Though occasionally death supervenes in these cases from an extension of the suppurative process backward to the meninges of the brain, yet this is such an uncommon occurrence, that the post-mortem appearances of an orbital cellulitis are but little known. Panas, however, reports such a case in the *Recueil d'Ophthalmologie* for January, 1874, and gives the results of the autopsy.

The case was a young man in whom the orbital tissue became inflamed as a consequence of a spontaneous attack of facial erysipelas.

Panas saw the case nine days after the erysipelas made its appearance, and found at that time white degeneration of the optic papilla, supposably from compression of the nerve. The case lasted from May 15th to November 1st, when death occurred from meningitis. At the autopsy there was no apparent external lesion of the eyeball. That portion of the cellular tissue known as the capsule of Tenon was perfectly normal, and this must be regarded as a most singular fact, in view of the intimate connection existing between this membrane and the contents of the orbit, and the very severe inflammation which had existed in the latter. On the contrary, all the other contents of the orbit, situated behind the fibrous capsule of the eyeball, in what Panas calls the summit or apex of the orbit, were discoloured, lardaceous, and all bound down into one confused mass, including the optic nerve, which had to be carefully dissected out. Another interesting point in the autopsy was, that the ophthalmic artery and vein, though very much reduced in calibre, were still permeable. In this case only the posterior part of the optic nerve in the orbit was directly connected with the orbital lesion. Furthermore the inflammatory process had extended to the brain through the sphenoidal fissure, and not by means of the ophthalmic vein and cavernous sinus, and this without involving the capsule of Tenon. The atrophic discolouration of the papilla might have been supposed to be due to compression, but a careful examination of the optic nerve showed it to be the seat of a neuritis from the optic foramen to the eyeball. Sections made at different points in its course, perpendicular to its axis, showed that the place of the nerve fibres was taken by a grayish, translucent, homogeneous tissue, intimately connected with the fibrous sheath of the nerve, and entirely formed of proliferating connective tissue. There was no trace of the central retinal artery. In the vicinity of the lamina cribrosa there was not a trace of nerve fibres. Hence the atrophy in this case was due to a proliferating neuritis, though the compression in the orbit may have had something to do with the origin of the neuritis.

The following five cases are reported in full, because of their unusual origin, the causation in each being different, and more or less directly traceable, except in one instance. Some interesting points in pathology are also shown, and may therefore be a sufficient excuse for the detailed history of the cases.

The first case originated in an aggravated exacerbation of trachoma and pannus, ended in total destruction of the eyeball, and the stump and mass of infiltrated orbital tissue were subsequently enucleated, and submitted to a microscopic examination.

The second case originated in a lacerated wound of the eyelids, the suppurative process extending from the lids directly into the orbital tissue, and also ending in destruction of the eye.

The third case started from a large perforating ulcer of the cornea, with extensive prolapse of the iris, and ended in panophthalmitis, with perforation of the sclera.

The fourth case was spontaneous, and no cause, except exposure to cold and wet, could be discovered. This also ended in total disorganization of the eye.

The fifth case was the most singular of all in its origin, occurring on the second day after an iridectomy for glaucoma, and starting from the wound. The inflammation was accompanied by grave head symptoms, and ended in panophthalmitis.

In all the cases the eye was destroyed, in four of them the disintegration beginning in the cornea. No treatment seems to be of any avail either in preventing suppuration of the cornea, or in staying it when once it has begun. In three of the cases the orbital cellulitis did not result in the formation of an abscess, but, after a varying length of time, resolution set in, and the symptoms then slowly subsided, without the appearance of any purulent discharge. According to the text-books this must be regarded as an unusual occurrence.

CASE I. *Orbital Cellulitis following Granular Lids and Pannus.*—Mary A. F., æt. 40. This patient had suffered from chronic trachoma and pannus for many years, but had never had any systematic treatment. She was an inmate of Charity Hospital in the summer of 1876, and while there contracted acute blenorrhœa of the eyelids, which was engrafted upon the chronic trachoma. The attack was a severe one in both eyes, but the inoculation proved to have been a most successful treatment for the pannus; for the corneæ, which had been very vascular and fleshy, began to clear up, and in about four months she was discharged with one perfectly clear cornea, and very useful vision in the other eye. In the latter part of December, 1876, both eyes again became irritable, and on admission to the hospital it was found that the trachoma had started up again. On Jan. 3, 1877, while the case was progressing favourably, the patient had a severe chill, which lasted about thirty minutes, and was rapidly followed by three more. Then began a deep-seated, throbbing pain in the right orbit; the eyelids became rapidly injected and swollen, and a dark-coloured, congested appearance of the conjunctiva appeared at the line of insertion of the external rectus muscle. Severe pain was then complained of in the right temple, the ocular conjunctiva became very œdematous, the œdema spreading from the point of deep injection over the external rectus, at first backwards in the course of the muscle, just as the injection had done, but rapidly surrounding the entire cornea. The eye soon began to protrude; the eyelids became very tense, hot, shining, and almost purple in colour; and this engorgement of the vessels extended from the inner canthus over upon the nose, down from the lower lid upon the cheek, and outwards from the external canthus upon the temple and side of the jaw. There was no extension, however, upwards upon the forehead, which I regarded as singular. The face was not erysipelatous, but the vascular injection was certainly remarkable. On the fourth day the cornea, which had been tolerably clear, was sunken deep within the œdematous conjunctiva, became rapidly infiltrated, and was soon little more than a mass of pus. The lower lid by this time was completely everted by the swollen conjunctiva and infiltrated subconjunctival tissue. At this time the patient began to complain of a very severe pain along the superior orbital margin, which, on the slightest pressure, became agonizing. It seemed to be of an entirely different character from the deep-seated orbital pain, and did not extend upwards upon the forehead, or seem to involve the supraorbital nerve. When the symptoms of orbital

trouble first appeared, a large dose (grs. xv.) of the sulphate of quinia was administered, and cold applications ordered to be used constantly. As soon as the tendency to the formation of pus became marked, these were stopped, and hot applications were employed assiduously, with opium to allay the pain. As soon as the exophthalmus appeared free incisions were made in the orbital tissue with a sharp-pointed, straight bistoury, in various directions. In several instances the knife was pushed backward till it reached the rear wall of the orbit; but on no occasion was pus reached. Under the influence of heat, the discharge became profuse, but there was very little pus, and at no time was the discharge anything more than a bloody mucus, or thin muco-pus. On the twelfth day the conjunctiva over the temporal side of the eyeball, ulcerated about five lines from the corneal margin, and the ulcer soon reached the size of a three-cent silver piece. A probe could be passed backward about half an inch, but there was no perforation of the eyeball until five days later, when the sclera ulcerated, and a bead of purulent vitreous made its appearance. From this time the symptoms slowly subsided, the lids became less tense and red, the exophthalmus receded, the eyeball slowly contracted under the influence of a subsiding panophthalmitis, and the pain ceased as suddenly as it began. On July 20, 1877, the stump of the eye was enucleated, and the patient has since worn an artificial eye. The abortive treatment by large doses of quinia, repeated leeching, and the constant application of cold, here failed utterly. There were some unusual features in the course taken by the disease in this case. The interference in the return circulation of the nose and cheek on the affected side was very marked, and is a phenomenon which I have not seen noted in the text-books. The failure to reach any purulent deposit by the knife, and the very small amount of pus discharged, seemed strange, but I have since met with the same thing several times. The occurrence of the peculiar pain along the orbital margin pointing to a marginal periostitis, and its subsidence without leading to serious bone trouble, is not common.

At the time of the enucleation, six months after the occurrence of the cellulitis, an attempt was made to remove a piece of the optic nerve in addition to the stump, but it was found so adherent to the orbital tissue that it could not be pulled forward. The remains of the orbital tissue, matted together by the products of inflammation, were then loosened from the orbital wall and excised, together with a piece of the optic nerve nearly half an inch long, for purposes of examination. This tissue was a dense, compact mass closely surrounding and connected with the sheath of the optic nerve, and, after being hardened, was examined microscopically. The sections showed a compact, dense mass of connective-tissue fibres, with numerous fusiform cells, and some round cells, granular and nucleated; scarcely a trace of the normal adipose tissue of the orbit, and a very marked hyperplasia of the optic nerve-sheath. There was no noticeable difference between the sheath and surrounding tissue. There was a well-marked thickening of the fibrillary trabeculae of the optic nerve, showing that there had been an extensive neuritis. Towards the centre of the nerve there were still some nerve fibres intact, but the mass of the nerve fibres had disappeared, and their place occupied by organized inflammatory exudation, fibres, and cells. This hyperplasia of the connective-tissue framework of the nerve extended nearly to the lamina cribrosa. The central vessels of the nerve were obliterated except near the eyeball, where there were still some blood corpuscles within the very reduced calibre of the artery.

There was no apparent thickening of the orbital margin, where one might have expected to find traces of the attack of periostitis, which had occurred in the course of the cellulitis. The stump of the eye showed the usual signs of a preceding panophthalmitis. The capsule of Tenon was thickened and firmly adherent to the sclera, but beyond this there were no unusual features shown on microscopical examination.

There was no trace of the ciliary nerves in the mass removed from the orbit, though a very careful search was made for them. In the stump of the eye there were traces of nerve fibres in places, but they could not be followed through the thickened sclera, and were hence probably entirely atrophied.

CASE II. *Orbital Cellulitis following Suppuration of the Eyelids from a Lacerated Wound.*—Lizzie M., æt. 26, seamstress, admitted to Charity Hospital in the summer of 1877. Patient has led an irregular dissipated life for several years. In the latter part of May, she received several blows in the face in a drunken brawl, one of which produced a severe laceration of both lids of the left eye. She was treated outside and the wounds sewed up, but the eyelids subsequently became very tense and red, and after about two weeks she entered the hospital. The left upper and lower lids were found very much swollen and reddened, boggy, and evidently containing pus. There was a long ragged wound through the upper lid, just to the inside of its centre, and extending from the palpebral margin upwards and inwards nearly to the orbital margin. In the lower lid the laceration extended through the entire lid and down upon the cheek in a direction downwards and outwards, with its upper end reaching the caruncle and dividing the lower lachrymal canal. There was a large extravasation of blood beneath the skin of the cheek, temple, and forehead. The cornea and aqueous were clear, as were the other media, and the eyeball was apparently uninjured, but there was a suspicious chemosis of the ocular conjunctiva surrounding the lower margin of the cornea, and a slight degree of exophthalmus. Both lids were freely incised horizontally, and considerable offensively smelling pus evacuated. The wounds were carefully probed, but no foreign body or dead bone could be found. They were then syringed with a solution of carbolic acid, and plain cold water dressings employed. Six leeches were applied to the left temple, and a large dose of quin. sulph. administered. The next day the lids were again very much swollen, the discharge was but slight, and the conjunctival chemosis had extended round nearly the entire cornea. The leeching was repeated and cold constantly applied, but the signs of orbital trouble became steadily more marked. In the course of the next twenty-four hours the eyeball became very prominent, and at one time the increase was so sudden as to cause a suspicion of a retro-bulbar orbital hemorrhage. A long straight bistoury was plunged into the orbit for the distance of an inch in several directions, but no pus, and only slight bleeding followed the wounds. Hot applications were then ordered constantly, and as the patient's general condition was very unsatisfactory, tonic doses of iron and quinia, and four ounces of whiskey were given daily. In spite of the treatment, and frequent incisions into the orbit, scarcely any pus made its appearance. The lids remained as swollen, hard, and red as at first, the exophthalmus, which was now very marked, remained unchanged for nearly ten days, and the cornea, at first transparent in spite of the annular chemosis of the conjunctiva, now became slowly infiltrated and opaque. At this period there was scarcely any pain, except on pressure, and the only symptom

pointing to any intracranial complication, was a tendency to somnolence. Towards the end of the third week resolution began, and all the symptoms slowly subsided. The cornea sloughed, and there was some slight purulent discharge from the lacerations in the lids, but from first to last there was no discharge of pus from the orbit, and hence no orbital abscess. At the end of the sixth week all swelling had subsided, shrinking of the eyeball was steadily going on, and an attempt was made to freshen and unite the wounds in the lids. This succeeded, and the wounds healed well, though slowly. The wound through the lower lid involved the canaliculus, and the distal end of this would eventually be obliterated, but the end next the lachrymal sac was slit up, and a style introduced for three or four days to keep it from closing. There was some little ectropium of the lower lid, or rather a falling away from the eyeball, but not enough to occasion much deformity.

The points of interest in this case are the cause of the orbital inflammation, the long continuance of the latter, and its final resolution without leading to the formation of abscess.

The inflammatory process probably extended from the laceration in the lower lid. The wound here at its upper end opened into the orbit, for it divided the lower canaliculus and involved the caruncle. Hence there was a possibility for the inflammation to extend by direct continuity from the suppurating upper end of the wound to the loose cellular tissue of the orbit. The first appearance of the conjunctival chemosis at the lower margin of the cornea would seem to favour this view.

In view of the bad condition of the patient and her dissipated habits, it is strange that the destructive process in the eyeball marched so slowly. The cornea remained clear for some days in spite of the marked conjunctival œdema, and after the infiltration made its appearance, its progress to complete suppuration was very slow. Then again the extreme violence of the symptoms in a broken-down patient would ordinarily soon lead to suppuration, especially where hot applications were used. But here there was no suppuration from the inflamed orbital tissue, and after three weeks of violent inflammatory action resolution set in, though not until the eyeball was destroyed.

In this case the inflammation was from the first an orbital cellulitis, and did not, as in two of the cases, begin as a more or less circumscribed inflammation of the fibrous capsule of the globe.

CASE III. Orbital Cellulitis following a large Perforating Ulcer of the Cornea with Prolapse of the Iris.—Thomas L., æt. 45, hostler, admitted to Charity Hospital January 19th, 1878. Patient has been a hard drinker all his life, but has had no venereal disease. One month before admission his left eye became inflamed and very painful. He underwent a course of treatment at one of the charitable institutions of the city, and an operation was done for artificial pupil. The eye steadily grew worse, and he came into the hospital. Is subject to attacks of acute rheumatism. On examination there was found a very large central perforation, occupying about two-thirds of the entire left cornea, with a large

prolapse of the iris, which was covered by a mass of exudation. The rest of the cornea was infiltrated; there was deep ciliary injection, exquisite tenderness on pressure, and marked *diminution* of tension. V. perception of light. The other eye was normal. Atropia (4-grain solution) was instilled every half hour, and cold applied every two hours for fifteen minutes until the next day. The extreme tenderness having then somewhat subsided, the large prolapse was excised, and a bandage was then applied. During the night the pain returned, and the bandage had to be removed. The case progressed slowly but favourably for eight days, when the conjunctiva round the outer margin of the cornea suddenly became chemotic, and the ciliary margins of both lids became œdematous. The pain, which had been slight, now returned, and was at first located along the upper orbital margin, but soon changed in character, became a throbbing pain, and was referred by the patient to the bottom of the orbit. The chemosis of the conjunctiva soon spread entirely round the cornea, but was most marked on the temporal side. The lids became enormously swollen, and the swelling extended for some little distance outward upon the temple. The exophthalmus was at no time very marked, and, in spite of the chemosis of the conjunctiva, there was no further extension of the corneal infiltration. The eyeball, however, became very hard, and was absolutely immovable. In this case the orbital inflammation did not manifest its onset by a chill, but was very sudden in its appearance, and made rapid progress. Repeated leeching, early and repeated deep incisions into the orbit, and the constant application of heat failed to stay its destructive march. An abscess formed above and to the outside of the eyeball, and was opened by the knife, and a small amount of pus discharged, with considerable relief to the patient. But the suppurative process went on, burrowed beneath the capsule of Tenon forward, and pointed just over the equator of the eyeball, between the superior and external recti muscles. This was also opened, and a probe, being introduced, passed through a hole in the sclera into the cavity of the eye. The process of recession and healing in this case was slow. Pus continued to be discharged from the two openings in moderate quantity for about four weeks. On April 3d all suppuration had ceased, and the eye was reduced to a small, irregularly-quadrilateral stump, with a large granulation over the seat of the second abscess. No sympathetic trouble in the other eye at any time during the course of the inflammation. The stump, however, is exquisitely sensitive, and at times the patient complains of a sharp, severe pain, which seems to run back "into his head," as he expresses it, so that it cannot be yet said that the danger of sympathetic trouble has entirely subsided.

In this case the original trouble was no doubt an "ulcus corneæ serpens," which had gone on to perforation, and prolapse of a large segment of iris. How the orbital inflammation originated is a difficult question to answer. It is of course possible that a draught of cold air blowing over the patient in bed, or a sudden fall of temperature may have been the exciting cause, but of this he had no recollection. Any direct connection, as of cause and effect, between the ulcerative process in the cornea and the orbital inflammation cannot be traced, especially as we have merely clinical observations to go upon. Such a theory would need the most rigid microscopic examination as a basis.

Another point to be noted in this case, and which I have since seen in other cases, was the change in location and character of the pain, from a sharp, shooting pain along the orbital margin to a dull, throbbing pain in the orbit.

The former did not last long enough to point to a periostitis, which, moreover, is not a common complication of orbital cellulitis, in spite of statements to the contrary in the text-books.

Another point was the œdematous condition of the ciliary margin of the lids, as the first sign of the swelling of the lids and among the first symptoms of orbital inflammation.

CASE IV.—Patrick L., æt. 40, labourer; admitted to the N. Y. Eye Infirmary, February 14th, 1878. The patient's left eye was lost fifteen years ago by a perforating wound of the cornea, just above the lower and nasal margin. There is one point of anterior synechia, lenticular and capsular cataract, the somewhat shrunken lens being attached to the iris at the point of corneal adhesion, and a somewhat atrophied globe. Good perception of light. While at work four days before admission, the right eye became somewhat tender and red, and in the course of the day the pain became so severe that he was obliged to stop work. On admission there was nothing abnormal to be seen, except a slight degree of deep injection and chemosis of the conjunctiva just over the insertion of the external rectus muscle. The pupil reacted, the media were all clear, the fundus healthy, and V. = $\frac{2}{30}$. The eye was, however, very sensitive to pressure over the point of injection. Suspecting a possible deep-seated trouble, two leeches were applied to the temple, and cold applications were ordered to be constantly applied. On the second day the injection and chemosis had spread somewhat towards the superior rectus muscle, and also backwards, and pain was still severe. Four leeches were again applied, a laxative given, and the cold applications kept up. On the next visit, two days later, the pain had diminished considerably, and the injection and chemosis had not spread. The temple was again leeches, and the cold still continued. Two days later there was a marked increase in the symptoms. The whole ocular conjunctiva was injected, the deep episcleral injection had extended backward and around the cornea, the conjunctival chemosis reached from the line of the inferior to the line of the superior rectus, and projected considerably above the cornea; and just over the insertion of the external rectus muscle was a distinct, hard, and exquisitely sensitive prominence, such as we see in scleritis or gummy infiltration of the sclera. For the first time suspicions of a venereal origin were excited, but a careful examination elicited absolutely no symptoms. Nevertheless the patient was immediately put upon anti-syphilitic treatment, and in addition atropia was instilled into the eye. At the next visit, however, the matter became a little clearer. The conjunctival chemosis was more marked, and extended around about three-fourths of the entire cornea; there was slight exophthalmus, and along the edges of the lids there was some œdema of the skin. From this time on the symptoms of orbital cellulitis became very marked; the lids rapidly became enormously swollen and deep red in colour, the exophthalmus increased from day to day, and the cornea was sunk within a wall of swollen conjunctiva which overlapped it. The pain was deep-seated and throbbing in character, and the patient complained greatly of a soreness of the frontal, parietal, and occipital

regions of the scalp on that side, which at times amounted to an absolute pain. His scalp was so sore that he could not bear to have it touched. The cornea soon became infiltrated throughout its entire extent, and finally sloughed off in shreds. Early and repeated incisions never reached any deposit of pus, and there was no purulent discharge until the lids became relaxed, and then the pus seemed to come from the conjunctiva, as in cases of blenorrhœa. The exophthalmus lasted for a long time, and was the last symptom to yield. Here was another instance in which there was no discharge of pus from the orbit, in spite of constant hot applications and free incisions into the inflamed tissue.

This patient presented the same early symptom of the swelling of the eyelids in a slight œdema of their ciliary margin, which I have seen in other cases.

In this case, as in the first one, the inflammatory action made its appearance over the insertion and along the course of the external rectus muscle. It is not impossible that at first we had to do with a localized inflammation of the capsule of Tenon, which soon spread to the loose orbital tissue. Subsequently there was a distinct localized infiltration either of the fibrous capsule of the eye, or of the sclera, or both, resembling so strongly a gummy tumour, which are common enough at this point, that syphilis was suspected. The vicinity of the external rectus muscle seems to be the favourite seat of gummata of the exterior of the eyeball; but why this is so, is not known. Signs of general cellulitis soon set in, however, and the diagnosis was made easy.

Another symptom in this case which I have also seen exceedingly well-marked in one other case, was the great pain in the scalp. It did not seem to start from any particular point and spread in different directions, but appeared all over the scalp, sometimes with equal severity at all points, at others being most marked in distinct regions, as the parietal or occipital. Whether this is caused by a neuralgic condition of the nerves of the scalp, starting from the supraorbital nerve within the focus of inflammation in the orbit, and extending to the whole scalp through the medium of the intricate anastomoses; or whether it is due directly to the general turgid condition of the bloodvessels of the scalp pressing upon the nerve filaments and thus causing pain, I am not prepared to say. Either hypothesis is possible, with perhaps the probability in favour of the latter.

CASE V.—*Orbital Cellulitis following Iridectomy for Glaucoma.*—T. B., æt. 58, contractor; a large, very robust man; first seen February 28, 1878. About eight months before I saw him he noticed that the vision of the right eye began to fail. There has never been any pain in the eye, and very little redness, but all that he complained of was that his vision was foggy. He has always been a healthy man, leading an active, out-door life, and has had no disease of any kind except intermittent fever, from which he has suffered at intervals for the last four years. His heart is irregular in action, but there is neither hypertrophy nor valvular disease. The vision has slowly and steadily failed until it is now reduced to counting fingers at one foot. On examination the cornea was slightly

hazy, like ground glass, the pupil moderately dilated and immovable, the fundus invisible from cloudiness of the vitreous, and the eyeball stony hard. There was a slight conjunctival injection at the outer margin of the cornea. The other eye was normal in every respect.

A diagnosis of glaucoma was made, and an immediate operation advised. The patient declined this and went away, but finally consented on March 11. The operation was performed on that day without an anæsthetic, a broad iridectomy being made upwards. The operation was normal in every respect, though there was considerable hemorrhage from the cut edges of the iris, which, however, was gradually worked out of the anterior chamber, leaving a clear pupil. In the evening of the same day the patient was comfortable, and the tension was perceptibly less. The next day the eye looked well, but the wound had closed throughout, which I regarded as an unfavourable symptom. The tension had, however, not increased again, and therefore the wound was not reopened, nor was paracentesis done. On the second day there was a little œdema of the margins of both lids, and slight chemosis of the conjunctiva along the line of the incision, with considerable deep injection. Six leeches were at once applied to the temple, and cold applications were ordered, and the wound immediately opened, as general inflammation of the eyeball was feared. But by the next day the signs of orbital cellulitis were well established. The eyelids were hot, red, and swollen, the conjunctiva injected and chemotic, and there was already some exophthalmus. The inflammatory action seemed to start from the neighbourhood of the wound and spread backwards. The chemosis was most developed at this point, and there was a distinct thickening and infiltration of the fibrous capsule of the eyeball, which was visible to the eye. At first the most violent symptoms were those of the lids. They became enormously swollen, almost purple in colour, and the great engorged veins extended upwards upon the forehead, outwards upon the temple, and downwards upon the cheek, showing the intricate network of anastomoses of the facial and orbital veins. The prominence of the eyeball increased very rapidly, and on the fifth day after the operation the cornea, deeply sunken beneath the chemotic conjunctiva, became infiltrated, the infiltration beginning at the centre, and within twenty-four hours involving the entire cornea. On the evening of the fifth day the patient had a chill, followed by high fever and profuse sweating. The next morning he had another chill, and that afternoon a third. His temperature rose to $104\frac{1}{4}^{\circ}$, and he complained of intense pain in the head. The entire scalp became very sore and tender to the touch. During the night of the sixth day he became delirious, and the perspiration was profuse. Free incisions had previously been made into the orbit, the knife being carried back to the apex of the orbit, but not a drop of pus made its appearance. Hot applications were constantly made, and large doses of quinia were administered. The veins of the temple were so enormously engorged that it was not deemed safe to apply leeches here, but they were applied on four successive days behind the ear. The patient's strength was rapidly exhausted, and it became necessary to administer stimulants in small doses, in spite of the continuance of the grave head symptoms. The tension of the eye remained greatly above the normal until the cornea sloughed on the seventh day. The pain in the eyeball then subsided a little. Though no pus made its appearance, the repeated deep incisions into the orbit produced copious hemorrhages, which seemed to relieve the patient, and the head symptoms diminished

in intensity. On the fourteenth day the patient had a very severe chill, followed by high fever and a rapid and alarming return of the head symptoms. He complained of a sense of fulness, and that evening a low muttering delirium set in. A deep incision was made into the outside of the orbit, and, after the bleeding had ceased, a weak solution of carbolic acid was injected. This caused a slight suppuration, and the next day the patient was easier. From this day the improvement was slow, but steady. Under the continued use of heat the swelling of lids and conjunctiva slowly subsided, and the exophthalmus receded. No discharge of pus occurred except a slight one after the use of the carbolic injection. The tension of the eye remained about normal, and, in spite of the slough of the cornea, it did not sink below this standard. The patient's general health gradually improved, but the turgid condition of the veins of the face, temple, and eyelids, and the dusky hue of the skin depending upon this, were the last symptoms to yield.

In this case there are several points of unusual interest. It is fortunately a very rare accident that an iridectomy for glaucoma should lead to such disastrous results. It seems impossible to disregard the fact that the orbital cellulitis followed the operation in the relation of cause and effect. Inflammation of the orbital tissue and panophthalmitis have been known to follow the operation for squint, and suppuration of the eyeball occasionally results after serious cutting operations upon the eye, such as the extraction of cataract; but that a simple iridectomy should be followed by orbital inflammation of such a severe type was a new article in pathology, and this is the only case of the kind that I have ever heard of. The inflammation seemed to spread in every direction from the wound; this is shown by the conjunctival chemosis first appearing along the wound. Its rapidity was very marked, for on the second day there appeared the slight œdema of the ciliary margin of the lids, which we have seen in other cases. The complication of malarial poisoning with the orbital trouble made it somewhat difficult to estimate the occurrence of the chills at their proper value.

The enormous vascular development in the skin of the eyelids, face, and temple, was an interesting feature in the case. The great, distorted veins stood out like knotted cords all over the corresponding side of the face, especially on the temple, and the intricate anastomoses between the orbital and facial veins was very clearly shown. The amount of exudation into and swelling of the orbital cellular tissue must have been so extensive that all venous communication between the orbit and the cavity of the skull was cut off, and as no blood could thus make its exit from the orbit into the cavernous sinus, it was all forced forward through the orbital and ophthalmic veins, and by their anastomoses into the branches of the facial veins. The anterior and posterior facial veins are very large vessels, and anastomose freely with each other and with the veins of the scalp. The superficial branch of the anterior facial, called the angular vein, arises from a union of the frontal, supraorbital, palpebral, nasal, and

superior ophthalmic veins. Through the frontal vein there is an anastomosis with the temporal and occipital vein. The palpebral veins empty partly into the angular vein, partly into the temporal, and these latter are again connected with both anterior and posterior facial veins.

Now if we turn our attention to the orbit we find that all the veins empty either backward into the cavernous sinus, or forwards into the facial, or into the vena ophthalmo-meningea; and they do so either directly or indirectly through the superior and inferior ophthalmic veins. As regards the course of the blood current, Sesemann (*Arch. für Anat. Phys. und Wissenschaftliche Medicin*, 1869) thinks that the blood from the orbital veins flows out not only backward into the cavernous sinus, but also forwards into the facial vein, and that the greater part of the blood, even in the natural state of health, takes the latter course. His reason for this opinion is, that the diameter of the collective openings into the facial vein is always greater than that into the cavernous sinus, the latter being sometimes very small. Sesemann regards the inferior ophthalmic vein, moreover, as serving to conduct blood not only from other orbital veins, but also from the cavernous sinus. He thinks that as much blood as can flow off through the narrow opening into the sinus, and that the rest goes into the anterior facial vein through the medium of the inferior ophthalmic vein. If, however, the pressure in the cavernous sinus increases, then the inferior ophthalmic vein empties not only its contents, but also the blood from the sinus, into the facial. All this is, of course, facilitated by the numerous anastomoses between the orbital veins.

Now if we have an extensive inflammation of the orbital tissues, with rapid and profuse infiltration by the products of inflammation, this loose mixture of cellular and adipose tissue becomes matted together into a dense, brawny mass. This takes place just behind the eyeball towards the apex of the orbit. It is not unreasonable to suppose that the veins become constricted, and finally entirely obstructed by the mass of exudation, and that the blood, not being able to find its way backward into the cavernous sinus, should all be forced forward towards the front of the orbit, and thence into the facial, palpebral, frontal, and temporal veins. This was the picture presented by the case of the last patient cited, in whom the various anastomoses of the facial vein were enormously engorged. Why the engorgement was most marked in the veins upon the temple is not clear.

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ARTICLE XII.

CASES OF LESION OF THE BASE OF THE BRAIN. I. SOFTENING OF CORPUS STRIATUM; HEMIPLEGIA NOT DEVELOPED UNTIL NEAR THE TERMINATION. II. TUMOUR INVADING OPTIC THALAMUS WITHOUT LOSS OF SENSIBILITY, BUT WITH LOSS OF CO-ORDINATION. CEREBELLAR SOFTENING. By FRANK WOODBURY, M.D., Assistant in Charge of the Medical Dispensary of the Jefferson Medical College; Physician to the German Hospital, Philadelphia, etc.

THE principle laid down by Hughlings Jackson, in his clinical studies, that paralysis and convulsions are not only signs of disease but supply evidence bearing upon the localization of movements and impressions in the brain and the functions of its component parts, opens a new field and offers a fresh incentive to clinical exploration. He classifies the causes of these symptoms under the now familiar titles of "discharging lesions" and "destroying lesions;" and acutely observes that "the phenomena constantly associated with such injuries, represent experiments made by disease upon the human brain, in a manner both imitating and supplementing the investigations made upon inferior animals by the hand of the physiologist."¹ We find therefore that faithful clinical observation may contribute to the progress of physiology. The fact that the functions of the cerebral ganglia of Gall, the corpora striata and optic thalami, are still unsettled, beyond the general impression, derived from their anatomical relations with the crura cerebri and the great motor tracts, that they are, in some manner, connected with motion and sensation, furnishes the motive for publishing these two interesting but isolated cases, which are offered, not in favour of any theory, but wholly with the desire to rescue from oblivion certain clinical and pathological facts, which may at some future time, and by some abler pen, be made tributary to the advance of medical science.

CASE I. *Acute White Softening of Right Corpus Striatum and Middle Lobe simulating Tumour; Hemiplegia developed towards termination of Case; Death from Coma.*—William F., a German, bookkeeper, single, æt. 36, came to me for treatment January 21, 1875. He appeared considerably older, but this was attributable to his nervous diathesis. With slight exceptions, his health had been uniformly good. He had gonorrhœa at twenty-one without sequelæ. He denied syphilis. Family history good; mother died of old age, father, aged 80, living and well. Other children healthy, except that one brother was subject to attacks of despondency bordering on melancholy, which is noteworthy in connection with the patient's tendency to become worried over trifles. In the beginning of 1872, he had a slight pharyngeal irritation and cough, and he dwelt upon this condition constantly, fearing consumption, until he became almost hypochondriacal. After a sea-voyage and spending some months

¹ Clinical and Physiological Researches on the Nervous System. No. 1, On the Localization of Movements in the Brain. London, 1875.

among his friends, his health was greatly improved, and he continued well up to his present attack.

Ordinarily temperate, a few nights before I saw him he had drunk more than usual, but not to intoxication. The night was very cold, and before retiring he bathed his face and hands in cold water. He slept heavily, and only partially covered, his left arm hanging over the side of the bed. In the morning he complained of general numbness, muscular pains and stiffness, but his left hand and forearm were completely powerless.

When he came under observation, motion had partially returned in the fingers; the paresis was more marked in the flexors of the forearm than in the extensors. Sensation was impaired on the dorsum of the thumb and index-finger, and to a less degree on the radial aspect of the hand over the first metacarpal bone. He was not prevented from attending to his business duties.

In the absence of other symptoms, the case was considered one of radial palsy due to cold and the constrained position; and treatment was instituted by hot and cold douches, friction, systematic exercise, and electricity; and, in truth under this regimen improvement at first was rapid, but soon a stage was reached where the arm continued about the same from one visit to the succeeding.

In the latter part of February some other features were noticed, which imparted a new aspect to the case, and suggested a lesion at the base of the brain. As the hand improved some rigidity appeared, which resisted flexion of the fingers and pronation and supination, but the muscles all responded well to the constant current. He complained of some thickness of the tongue, of an unaccustomed difficulty in pronouncing certain words, and of occasionally biting his tongue, which seemed too large for his mouth, although not really increased. He also called attention to numbness of the lips, and to the occasional accumulation of food on the left side of the mouth. The tongue and palatal arches showed no deviation; but an inspection of that part of his face which had been hidden by the beard, now revealed drooping of the angle of the mouth on the left side, and partial loss of expression.

On the 10th of March, the symptoms of glosso-labial palsy were less marked. The hand had nearly regained its power, and the anæsthetic area had faded away.

The next afternoon he had, for the first time, a fit. I saw him seated in a chair a few minutes later, conscious, but looking much dejected. His voice was peculiar, and a state of mental erethism was shown by his rapid ejaculatory speech and whining tone. He had been in his usual health all the forenoon; but upon rising to accompany a friend, with whom he had been chatting, to the door, he fell forward to the floor. He had vertigo; but no headache, loss of consciousness, or muscular spasm.

There was no ptosis or squint, pupils moderately dilated. He read, without hesitation, from a newspaper, when requested to do so. A watch was heard at more than two feet on the right, but at only one inch from the left ear. (Deafness had not been noticed before.) Increased left-sided facial palsy, with local anæsthesia, was observed. Tongue now protruded to the left. Forearm again hung helpless at his side. No cardiac murmur existed, the first sound was rather weak.

After taking some alcoholic stimulant, he was able to ride home, but during the night had another attack, and fell out of bed. He now sought admission to the Orthopædic Hospital, under the care of Dr. S. Weir

Mitchell, to whose courtesy I am indebted for permission to complete this case from the hospital record book.

Ophthalmoscopic examination was entirely negative. Sensation now decidedly impaired in the hand. Loss of power in forearm not complete, nor confined to parts supplied by the radial nerve. Fingers were contracted, and there was also rigidity in the forearm. Impairment of sensation existed in the left side of the face. He could readily open and shut both eyes, but closed them tightly only with effort. There was loss of lateral control of the left eye (a new symptom). Tongue was protruded to the left, but he could turn it to the right. He bit his tongue in eating, but not during sleep. The branches of the right temporal artery swollen and tortuous; vessels of left temporal region were scarcely visible. He had had continual throbbing on the right side of his head for years, connected with former attacks of neuralgia.

For the first few days after entering the hospital he was delirious and restless. The paralysis in the left arm now became associated with loss of power in the left leg, which steadily increased. A blister was applied to his left temple; iodide of potassium given in five grain doses every three hours, and a drachm of bromide at bedtime. Under this treatment he apparently was improving, on March 27th, but the next day there was absolute loss of power in the left arm and leg, and incontinence of urine; mind sluggish, sleep disturbed. Iodide was discontinued, and mercurial inunctions substituted.

A few days later, though he answered questions more readily, the hemiplegia continued the same, and ptosis of right eyelid appeared. Coma set in, and he died April 3, 1875.

An ophthalmoscopic examination two days before death failed to detect any abnormality.

Autopsy.—No emaciation. Thoracic and abdominal viscera healthy; cardiac valves not diseased. Vessels of membranes congested; longitudinal sinus contained a large firm clot.

Right hemisphere prominent and fluctuating on its superior surface, in the convolutions in front of the fissure of Rolando. Right middle cerebral artery contained a firm clot from its first bifurcation, extending about one inch.

The softening on the right side extended nearly from surface to base, partially involving parietal and almost entire anterior lobe; the right corpus striatum being disintegrated and diffuent; anterior margin of optic thalamus somewhat softened.

The clot in middle cerebral artery was attached, and fully occluded the vessel. Puncta vasculosa large, and dark coloured.

Since no record was made to the contrary, the floor of the fourth ventricle was probably in general appearance healthy. A careful microscopical report of the condition of the nuclei in the medulla oblongata would prove of interest in view of the glosso-labial symptoms (paralysis of Duchenne), and the evident involvement of the portio dura and left auditory nerve. This could not be furnished, as no specimens were allowed to be removed.

CASE II. *Glio-sarcoma in Third Ventricle encroaching upon Left Optic Thalamus; Softening of Superior Surface of the Cerebellum; neither Paralysis, Convulsions, nor Anæsthesia, but marked loss of co-ordination*

in Lower Extremities; Death from coma.—November 15, 1877, was called to see Thomas B., *act. 45*, Irish, roofer, married. Found him complaining of vertigo, headache, and a constant hissing sound in his ears, like escaping steam. He could not localize his headache, and no local explanation of the tinnitus could be discovered. There was a harsh murmur taking the place of the first sound at the mitral orifice, but the heart's action was regular, and the impulse not exaggerated. Appetite good, tongue slightly coated, bowels constipated, no albumen in the urine. Some mental dulness was thought to exist, and his memory was impaired. His health was good; "he had never been sick a day in his life," and his wife testified that he had not lost a day from sickness for seventeen years. After repeated questioning, his sister recalled that fully five winters before this attack he had fallen from a step and struck the back of his head with great violence, but he was able to walk home, and went to work as usual the next morning. He had not complained in the mean time. He was of temperate habits, and free from venereal taint.

He had been exposed to the sun, and frequently during the preceding summer complained of headache; but never had been sunstruck. In the spring of 1877 he felt as well as he ever had in his life. One day in August, after lying down, he noticed a general feeling of numbness come over him, without pain or paralysis. Following this, however, he occasionally felt dizzy. Being unable to obtain employment at this time, he did not work again until the early part of November. Vertigo now annoyed him very much, and also a peculiar noise in his ears, which gradually increased. One morning, after starting for work and going a short distance, he could not remember the way to his accustomed place of business, and was obliged to return home.

He had sought medical advice Nov. 8th, but his symptoms were not relieved. He staggered and stumbled in walking as if intoxicated. The tinnitus also became aggravated, so that, on the day before I saw him, he kept his bed. Previous to this he could walk, but was unable to maintain his balance in the dark, or with his eyes closed. He had some numbness in his legs and arms, but no actual loss of sensibility. Some myopia existed, but no changes were discovered by the ophthalmoscope, except that the disks were unusually red.

He was given iodide of potassium, increased to a drachm daily, with frequent cathartics, and blisters were applied behind the ears and at the back of the neck. He rapidly improved, and Nov. 27th was allowed to sit up. During this period he had some hallucinations, but his symptoms at this note had almost entirely disappeared. Some mental lethargy was observed, which might be habitual with him. On Dec. 7th he went out for the first time. His eyes were examined by Dr. Little at the Hospital of the Jefferson Medical College, and no evidence of disease detected; there was, on the contrary, rather less congestion of the disks. In this improved condition he had remained for more than a week, not attempting any active exertion, when the symptoms gradually reappeared. It was now thought advisable to take him to the Pennsylvania Hospital, where he was received Dec. 19th, and remained until Jan. 12, 1878, under the care of Dr. Da Costa.

It should be stated that he had used Fothergill's solution of hydrobromic acid to relieve the tinnitus. The dose was cautiously increased to a drachm three times a day; no effect being noticed, it was discontinued. Bromide of potassium was also tried, without any effect upon the symptoms, except that it seemed to increase the dulness.

While at the hospital the head-symptoms remained about the same, but his staggering became more marked and he had several falls. The tinnitus and vertigo were constant when he was sitting up, but less marked and sometimes absent when lying down. He slept heavily, and felt better when he first rose in the morning than afterwards. He had no paralysis, and answered questions intelligently, but slowly. He was taken home again by his friends.

Jan. 12. Confined in bed, and given phosphide of zinc and *nux vomica*, and a diet consisting largely of milk. About a week afterward, in getting into bed, losing his balance and trying to regain it, he staggered backward across the room, and fell against the opposite wall. His wife subsequently reported that whenever he stood erect he had a constantly increasing tendency to stagger backwards; until, finally, towards the middle of March, attempts at walking completely failed. When he was supported on his feet, the right leg was spasmodically thrown across the left, he could not make a step; but in the recumbent posture, neither spasm nor paralysis could be detected. His knees were unable to support his body; but he was able to accomplish any required muscular movement, and kick strongly, while lying upon his back.

In the early part of February divergent squint and diplopia appeared and became permanent. There was no prominence of the globes. He generally used his right eye, but vision was unimpaired in the left. No diminution of the area of vision appeared on rough examination in either eye. The eye-grounds were normal. The slight strabismus was attributed to spasm of the left external rectus. From the beginning of his illness he showed complete disinclination to reading, although he had previously read habitually. He had not, however, complained of his eyes.

For a short period, fluid extract of ergot was given in drachm doses, three times daily. He did not get worse under this treatment, but as he did not improve, it was decided to return to full doses of potassium iodide, which promised better results, but signally failed. Blistering partially relieved the tinnitus, but not entirely. On March 13th, a seton was introduced into the back of the neck. From this date the noises and headache entirely disappeared, and he remained the last month of his life free from pain. During the last three months he gained more than twenty pounds. He had no bed-sores.

In March it was noticed that the left leg was moved quite frequently in bed. He had also complained of some stiffness in the left arm, but as it was transitory, and he had fallen out of bed a short time before, it was attributed to contusion; at all events there was no apparent rigidity, and all the movements and tactile sense were preserved unimpaired. During the last two or three weeks he had some difficulty in swallowing; the food sometimes seemed to nearly strangle him, but whether due to spasm or paralysis was not determined. He now had involuntary alvine discharges. Previously, however, he had been unable to retain his water for any length of time, and frequently passed it in bed. He slept heavily, and occasionally had hallucinations. He could not remember how long he had been sick, and frequently asked to be allowed to get up and go to his work. On the 6th of April he was more lethargic, and the next day unconscious; cheeks and forehead flushed, the rest of the face pale, nose pinched, and eyes sunken. Temperature of body not elevated; but head warmer than usual; pupils regular, responded slowly to light; pulse compressible, accelerated, not very full; respirations twenty-four in the min-

ute, sometimes sighing. Hypostatic congestion of both lungs existed; the heart's action was failing; the right cavities overloaded. Congestion of the lungs and brain being present, he was ordered two drops of croton oil at once, to be repeated in two hours; turpentine stupes to the chest and abdomen, and sinapisms to calves of legs.¹ A rubber cushion containing ice-water was placed under his head, and cold compresses applied. In the evening the circulation had become equalized; his breathing natural; he had no cough nor fever; the bowels had been opened freely three times. The next morning he recognized his wife, ate breakfast, and conversed with his friends. The difficulty in swallowing still continued, but no paralysis nor muscular spasm existed in the extremities; he moved all of them with equal facility. During the next few days he gradually became comatose, and died April 10th, 1878.

Autopsy made by Dr. Morris Longstreth (from whose report the following is condensed).—Heart slightly enlarged, mitral valves thickened by old deposit; lungs partly consolidated (hypostatic pneumonia). Brain firm, convolutions decidedly flattened, membranes slightly congested; deposit resembling connective tissue in interpeduncular space, where part of third nerve was included and bound down, and arachnoid was thickened and adherent. Tumour, size of walnut, found in third ventricle, moulded to the interior. Pressed surrounding structures in all directions. It was wedge-like above, broad below, extending to base of brain just above corpora albicantia, and forwards as far as anterior commissure. A caudate prolongation completely blocked up the *iter e tertio ad quartum ventriculum*. Owing to this obstruction, a large quantity of serum had been imprisoned, enormously distending the fourth and to a less extent the lateral ventricles.

The growth invading the left optic thalamus contained small hemorrhagic areas; its outline was not well defined, as it shaded off into normal tissue, penetrating and pushing the parts asunder; corpus striatum and internal capsule not implicated; right geniculate bodies unaltered, left scarcely distinguishable, and corpora quadrigemina separated and flattened; fornix softened posteriorly; ventricular walls not softened. Medulla oblongata widened, nuclei not atrophied. Left crus cerebri and optic tract flattened, not otherwise changed.

Tumour originated in gray matter of middle commissure or left optic thalamus, and grew across to the right; no other attachments existed. Superior surface covered by ventricular ependyma, and striatum zonale of left optic thalamus; it presented the characteristics of *glio-sarcoma*.

Left optic globe examined. Outline of disk irregular, not prominent; vessels obscured at border, and appeared to dip. (This may have been merely a post-mortem appearance.)

Superior surface of cerebellum showed an area of softening from median line to middle of right hemisphere, and from cortex to medullary area, the latter was not involved.

Briefly reviewing a few of the prominent points, it is noticed that in

¹ According to the observations of Schüler, a warm, wet compress applied to the belly or back, is immediately followed by a more or less energetic and persistent contraction of the vessels in the pia mater in trephined animals. They may thus act, as remarked by Winternitz, as do pediluvia and sinapisms to the abdomen, by diminishing the amount of the blood in the brain.—*London Practitioner*, April, 1878, p. 253.

the former patient the primary symptom was the radial paralysis. Two explanations of this case suggest themselves. First, the cerebral affection preceded the palsy. There was atheroma of the smaller vessels, impaired circulation, mal-nutrition, and finally degeneration of that portion of the ascending frontal convolution containing the motor centre for the left arm (Hitzig).¹ Stasis and coagulation took place in the capillaries of this area. At the time of his fit, the clotting ran backward to the vessels at the base. Softening occurred, because the disease of the minute vessels prevented the establishment of the collateral circulation.

The second hypothesis is, that the paralysis of the arm was rheumatic, and it preceded and invited the disease of the motor area, from suspension of function, a pre-existing vascular degeneration favouring this condition. The subsequent course being the same.

The first supposition appears more plausible, but the latter is by no means improbable. We know that muscles in a state of rest have their blood-supply diminished, while during action it is increased; that the secreting glands follow the same law; that the hemispheres themselves have their circulation increased by emotion and sustained attention. May not this occur in any other nervous centre when its functions are elevated? If so, then a depression of function should diminish tissue-change and blood-supply, and such a condition exists in rheumatic palsy, or after amputation. In truth, this view receives strong confirmation from the observation recently made, that after amputation of a limb the corresponding area in the brain shows atrophy to a remarkable degree.²

Either view is on the ground that there was disease of the small vessels, and that the condition was one of thrombosis rather than embolism. The facts that the heart was absolutely healthy, and that there were no embolic patches in the lungs or other viscera, warrant this assumption. It is also believed that the plugging preceded the acute softening, since it has been positively declared by an eminent observer to be the law of this condition.

Sufficient local cause appeared to exist for the radial palsy in the constrained position and cold, and it is not denied that this may have been entirely disconnected from the central disorder, except through the coincidence of the subsequent hemiplegia of the left side. The supposition that the rheumatic paralysis was primary, indeed offers the simplest explanation of the appearance of the anæsthetic area on the hand.

In regard to the two weeks' delay of the hemiplegia after the throm-

¹ Franck and Pitre's experiments, and the analysis of cases in M. Charcot's wards, also, serve to indicate that paralysis predominates in the upper extremity when the lesion is most marked in the anterior part of the internal capsule, as it was in this case.—*Monthly Abstract*, from *London Med. Record*, Feb. 15, 1878.

² Case of M. Proust, presented to French Hospital Society, Boston Med. and Surg. Journal for May 16, 1878, from *Medical Examiner*.

bosis, it is possible to assume either that the arterial trunk was not completely occluded until this period, or that the paralysis signalized the onset of softening.

Case II. was, at first, looked upon as one of chronic basal meningitis; but this view was subsequently excluded by the course of the disease. There was no fever, although the record was kept for weeks at a time; there was neither vomiting, cramps in the limbs, nor convulsions. He never had excitement nor active delirium. The examination, it is true, revealed a small amount of thickening of arachnoid and new deposit at the base, which was probably sufficient to account for the strabismus through the involvement of the trunk of the third nerve.

The involuntary fecal discharges before the appearance of coma, pointed to a discharging lesion at the base of the brain, *i. e.*, a tumour; and it has been frequently observed that involuntary alvine evacuations occur in a certain number of cases, as the *primary symptom* of tumour at the base of the brain.

The staggering backward strikingly recalled the physiological experiments of Magendie and others, and led to a diagnosis of disease of the upper surface of the cerebellum, which was, indeed, softened, although the tumour was not beneath the tentorium, as had been anticipated. In connection with this lesion of the cerebellum it is proper to state that persistent priapism did not exist, and during the latter part of the disease there were no erections whatever. In view of the fact that direct communication has been shown by Meynert to exist between one half of the cerebellum and the opposite optic thalamus, it is perhaps significant that the crossed lesion existed in this case.

That there was no actual paralysis of sensation may be thought to be due to the fact that the optic thalamus was not sufficiently destroyed to produce entire abolition of its function. It is acknowledged, however, that a general sense of numbness existed, *but it was not confined to one side*. May not this observation, coupled with the fact that the tumour grew across in the gray commissure from the left optic nucleus to the right, warrant the view that these bodies ordinarily act as a unit, not unlike the gray matter of the spinal cord? And the experiments of Brown-Séquard upon the spinal cord have shown that a relatively greater destruction of gray matter is required to paralyze sensation than to abolish motion.

The fact that hemianæsthesia was not present is quite in conformity with the experiments of Veyssièr,¹ who found that this does not occur from destruction of the optic thalamus in dogs, unless the internal capsule is also injured.

The early tinnitus aurium and vertigo, with impaired hearing, suggested

¹ Recherches sur l'Hémianæsthesie de cause cérébrale. Paris, 1874.

Menière's disease, and it is rather unfortunate that the internal ear was not made the subject of careful study. It is thought, however, that a sufficient central cause existed for the appearance of these symptoms.

It is very noticeable that this, which, being in an otherwise healthy man, approached as nearly as possible the condition of an uncomplicated tumour of the brain, should have been accompanied by so few of the symptoms that are ordinarily considered characteristic. He had no intense, persistent headache, no vomiting, no general or peripheral paralysis, no facial palsy, and, above all, no choking of the optic disks. Tonic muscular spasm was not present to any decided extent; the affections of the eye-muscles and the œsophagus were the only motor disturbances present, if we except the loss of co-ordination in the lower extremities, which approached this condition.

The remote history of injury seems to coincide with the view expressed by Obermier that gliomata may result from injury to the skull, and he observes that the history of such an occurrence furnishes one of the points in the differential diagnosis between cancer of the brain and a gliomatous tumour.¹

It is to be remarked that no aid in the diagnosis was furnished by the ophthalmoscope in either case, although the eyes were repeatedly examined by different observers.

ARTICLE XIII.

COLD WATER ENEMATA AS A THERAPEUTIC AGENT IN CHRONIC DIARRHŒA. By MICHAEL J. B. MESSEMER, M.D., Physician for Internal Diseases in the Out-door Department of the Mount Sinai Hospital, New York.

CASE I.—On July 18, 1877, I was called to see a boy four years of age (the little son of Mr. M., residing at 204 Broome Street), where the following history was elicited :—

The first summer of the child's life, when only six months old, he was attacked with summer complaint (the ordinary entero-colitis of young children), which was treated by Dr. W., who was successful as far as the acute symptoms were concerned, but he was unable to control the diarrhœa entirely. After having treated the case about one year, and acute symptoms returning in the summer, he was discharged, and the child was put under the care of Drs. A. and T. The only result their treatment had was to put the child under the influence of opium, but the boy, being of a rachitic and very delicate appearance, always had more or less diarrhœa during their treatment, and had never learned to walk. Thus far he had not gained strength nor lost much, but later on he seemed to grow weaker and weaker, and Drs. A. and T. said he would finally die of inanition.

¹ Article on Cerebral Tumours in Ziemssen's Encyclopædia, vol. xii. p. 263.

Status Præsens.—The child was small for his age. He had a very cachectic and emaciated appearance. The temperature in the evening was 102° Fahr. in the rectum. The abdomen was distended with gas; there was some tenderness in the left iliac fossa. He was slightly delirious, and had about twenty passages that day. The stools were of a dark-grayish colour, tinged with a little blood, and contained some of the ingesta. In fact, to use the father's words, everything passed through except whiskey and water, but he was not sure that even that was retained. Everything else he could see in the stool, even milk.

The child was given bismuth gr. v, and pepsin gr. i, every two hours, and no other nourishment but brandy and water in the following twenty-four hours. He was also ordered injections, per rectum, of a quart of ice-water after every passage, but only in portions of half a pint at a time, and after every injection the exit of the water was to be facilitated or assisted by the hand being placed on the abdomen, and thus pressure exerted.

On July 22, 1877, the child looked brighter, the temperature was reduced to $100\frac{1}{2}^{\circ}$ in the rectum (in the evening). The number of passages had been reduced to eight in twenty-four hours. The child was ordered milk with a little lime-water. This was well borne.

On the 25th of July, the number of passages being reduced to four in twenty-four hours, and the temperature normal, he was ordered beef-tea, which was also well borne.

August 4. The child looked bright, and sat up in bed, played with his bed-clothes and toys (something he had not done before during his long illness). He was now permitted to eat even fruit and vegetables, which were also well borne.

Sept. 13. The boy has been eating everything except meat, looks very well, and can walk short distances.

20th. He has had an increased number of passages, as many as seven in twenty-four hours, which I attribute to the parents having omitted the cold-water injections, and permitted the child to eat hard-boiled meat. Ordered renewal of cold-water injections.

24th. Child is better, and bright again, the number of passages being reduced to one a day.

Nov. 11. The boy walked into my office, accompanied by his father. He looked pale, but hearty, and was able to run and play as if he had never been sick. We still continued the cold-water injections, however, omitting them only when constipation came on, for which a tablespoonful of olive oil was given, which would regulate the little fellow's bowels. He was also put upon cod-liver oil, with very good results.

Feb. 20, 1878. The child is looking remarkably plump and well. All treatment was discontinued after this date. He has been quite well till date.

CASE II.—K. P., of No. 332 East Fifty-ninth Street, native of Ireland, 29 years of age, single. Had no sickness of any account, except when a child had smallpox.

In the early part of June, 1877, patient was seized with an acute diarrhœa, which soon subsided. A short time after, she again found her stools becoming watery, and the number of her passages were increasing. She then consulted Dr. H., who treated her, but without success. Finding his patient growing weaker, he advised her to go to a hospital for treatment. There her treatment first consisted of hypodermic injections of

morphia, followed by tannin and opium internally, which had no effect upon the diarrhœa; then bismuth was added, but in spite of all this treatment the passages increased to such an extent that the patient avers she counted nearly forty passages in twenty-four hours.

The tannin, opium, and bismuth were finally stopped, and the patient was put upon brandy and water, with a little milk. This latter treatment had a comparatively good effect, as it reduced the passages to three or four a day, which continued so until she left the hospital on the 22d of November, 1877. She then placed herself under the treatment of Dr. C., who gave her powder, pills, and a medicine, which would check the diarrhœa for one day; but it would return on the following day in spite of continued use of the remedies. The patient remained under this treatment until the 16th of January, 1878, when she applied for treatment to me at the out-door department of the Mount Sinai Hospital, stating that she was given up by her physicians, and that the doctor had inquired of members of her family if she still lived.

Her present condition is as follows: She has had between thirty and forty passages the preceding twenty-four hours, and nearly the same number during the day for some time previous. There was no blood in the discharges, but some mucus. She had much tenesmus. Her food passed from her as she took it. Rectal examination proved negative. She was very much emaciated, and complained of weakness and lassitude. Temperature $102\frac{2}{3}^{\circ}$ in the axilla. The abdomen was distended; some tenderness manifested on pressure, though not particularly localized.

She was given the bicarbonate of soda internally, and ordered to inject a quart of cold water (in divided portions) after each passage. The exit of the water was to be brought about by pressure made upon the abdomen. After the water had been expelled, the patient was to take a small quantity (say about half a tea-cup) of cold water, and inject slowly, so as not to excite any peristaltic action. This small amount of cold water was to be retained by the patient, and serves to keep the walls of the rectum from coming in contact. The patient was also allowed to take ten drops of the tincture of opium, if the tenesmus persisted. Her diet was to be milk and brandy, toast, and beef-tea.

The patient returned on the 20th, reporting that her passages were reduced to four in twenty-four hours. Her temperature was $99\frac{1}{2}^{\circ}$ in the axilla. Her general appearance was better. She stated that she had felt hungry and ate vegetables. She was ordered to continue the treatment.

On the 26th the patient returned, stating that she had no passage during the past two days. The treatment was suspended, and patient ordered to return on the 28th. She did not return, however, until the 9th of February, when she stated that her diarrhœa had returned the last two days, and that the number of her passages were about eight during that time. Treatment ordered to be resumed. She returned on the 18th, stating that she felt as well as though she had never been attacked with sickness. Has a good appetite, and but one passage a day. Her temperature was normal, and she was gaining in flesh.

I saw her on the 22d March; she was then quite well, and had but one passage daily.

CASE III.—A. K., 33 years of age, native of Germany, residing at 139 Forsyth Street, married thirteen years, and has four children.

In her youth she suffered from chlorosis. Nine years ago had varioloid.

In June, 1876, the patient commenced suffering from diarrhœa, which was so severe that she was obliged to call in a physician on the second day of her illness. At that time the number of her stools were about twenty in every twenty-four hours. Her physician treated her with tinct. catechu and bismuth internally; he also gave her iced red wine and cognac to drink. This treatment somewhat reduced the number of passages. The diarrhœa persisting, however, she was ordered injections of starch and opium. She continued under this treatment until about the middle of September, when she consulted Dr. L., who prescribed pepsin and opium to be taken internally, and ordered her to take hot sitz-baths (hip-baths). She was under this treatment about a month. The patient then placed herself under the care of Dr. C., who treated her with opium and tannin internally, injections of tannin, and suppositories of morphia and iodoform per rectum. This treatment was continued with some benefit.

Her means becoming exhausted, she presented herself for treatment to me at the out-door department of the Mount Sinai Hospital about the middle of February, 1878.

Her history at that time was as follows: She had about eight passages daily, followed by persistent tenesmus. She had pain in the sacral region, and occasionally pain in the hypogastric region.

Her discharges were always thin and watery, of a grayish colour, and accompanied by mucus and blood. Her appetite was poor, and her general condition indicated great debility. She was quite reduced in flesh, and a marked contrast, as she says, to what she formerly was.

Rectal examination proved negative. The urine was of an acid reaction. Spec. grav. 1020. Contained no albumen.

She was put upon cold water injections, and bicarbonate of soda was given internally as a placebo.

In one week her passages were reduced to one per day. The blood and mucus had disappeared after the third day. There was no tenesmus after the first injection.

On the 6th of April, 1878, I saw the patient. She states that she had been entirely well since the first week of treatment, and that she had gained flesh and weight correspondingly. Her appearance verified her assertions.

The idea of treating chronic diarrhœa with injections suggested itself to me after having treated some cases of dysentery. The tormina and tenesmus accompanying dysentery I have treated by injections of cold water and opium, and cold water alone. In my opinion these injections relieved the tenesmus and tormina, as it washed out the irritating substances, and thus cleansed the rectum, and lessened its irritability, and, as it appeared to me, that the increased number of passages, which continue through chronic diarrhœa, were due to increased sensibility and irritability of the rectum, which was kept up by irritating material, such as mucus and feces contained therein (as the majority of cases of constipation are due to decreased sensibility and habit), I entertained the notion that by cleansing the rectum of such irritating matter by injections the exciting cause or influence might be removed, or at least relieved or rather mitigated.

Consequently I made experiments at first with warm water injections

(as it occurred to me warm water would certainly be as efficient if not more so than cold in cleansing the rectum) on myself, when I had one passage daily in the early part of last summer. I found that after the warm water injections had been continued a few days the stools would become watery, and in a week or ten days the number of passages would be increased, a few days thereafter the number of stools would again be reduced, still there would be more than one passage per diem, and that the stools would remain watery. By this experiment I found that simply removing the irritating mucus or feces by warm water (which certainly removed them) would not attain the result that I had ascribed to it.

Thereupon I injected cold water after each passage, and found that the number of stools decreased. I kept on with cold water injections, which brought on constipation. It was found necessary to relieve this constipation with a cathartic.

I experimented upon myself at various times since with the same result. I also experimented upon others and found that cold water injections continued after each passage would bring on constipation. A cathartic would, however, quite readily relieve this constipation in every case.

These experiments show that cold water possesses astringent properties. Its anodyne properties have long been proven in dysentery. Moreover, the water acts as a protectant to the mucous membrane of the rectum; when slowly injected, so as not to excite peristaltic action, it will keep the rectum distended, and its walls apart, thereby preventing their irritating each other, as it makes it impossible for them to come in contact until the water thus injected is absorbed.

In the treatment of chronic diarrhœa I do not object to internal treatment being added to the cold water injections, but I consider dieting the patient properly, in aggravated cases, of the highest importance, for obvious reasons.

I have carefully studied both the American and foreign literature on the subject as far as accessible. On searching Schmidt's *Jahrbücher*, Virchow's *Jahresberichte*, etc., I find that some German authors (Winternitz, Monti, Runge) had indeed used cold water injections in acute diarrhœa, but combined with other hydro-therapeutic measures. Dr. Winternitz, for instance, used cold water injections in the diarrhœa of children, but at the same time applied cold water compresses over the abdomen. No mention, however, is made of cold water injections for the treatment of *chronic* diarrhœa in either the European or American literature as far as I have been able to ascertain.

ARTICLE XIV.

HARVEY AND THE TRANSIT OF THE BLOOD FROM THE ARTERIES TO THE VEINS "PER POROSITATES." By W. S. FORBES, M.D.,¹ Senior Surgeon to the Episcopal Hospital, Philadelphia.

IN the life of Harvey, written by Doctor Robert Willis, and prefixed to his translation of the works of Harvey, page xli., published by the Sydenham Society, in 1847, we find this assertion: "For Harvey, it must be observed, left the doctrine of the circulation as an inference or induction only, not as a sensible demonstration." Again: "His [Harvey's] idea of the way in which it was accomplished [transit of the blood from the arteries to the veins] was even defective; he had no notion of one order of sanguiferous vessels ending by uninterrupted continuity, or by an intermediate vascular network, in the other order."

In Sharpey and Quain's Anatomy (see "capillaries"), we find the following statement: "That the blood passed from the arteries into the veins was of course a necessary part of the doctrine of the circulation, as demonstrated by Harvey; but the mode in which the passage took place was not ascertained until some time after the date of his great discovery." The words "not ascertained" in this paragraph are guarded, yet the impression is decidedly made that Harvey did not have the idea of the way in which the blood is conveyed from the arteries to the veins. The same statement has been made by others.

In a lecture delivered at the Royal Institution, London, on the 25th of January last, Mr. Huxley is reported as having said: "One thing Harvey could not do, because the instruments of the time would not enable him to do it. He never gave the exact channels by which the blood passes into the veins."—*British Medical Journal*, Feb. 2, 1878.

Harvey's treatise, written in Latin, was published first at Frankfort, in 1628. It is a fact that the compound microscope, consisting of two lenses placed at a distance, so that the one next the eye magnifies the enlarged image of any object placed in front of the other, was invented by Hans Zansz, who, with his son, Zacharias Zansz, were spectacle makers at Middelburg, in Holland, about the year 1590. One of their microscopes, which they presented to Prince Maurice, was, in the year 1617, in the possession of Alkmaar, who then resided in London as mathematician to King James VI. (See Quekett *On the Microscope*, who speaks on the authority of Sir David Brewster; see also *Encyclopædia Britannica*, "Microscope.")

It does not require, however, a compound microscope to see the vessels in question. A common double convex spectacle glass, magnifying only

¹ An extract from an address delivered before the College of Physicians of Philadelphia, on the Tercentennial Anniversary of Harvey's birth, April, 1878.

three and a half diameters, gives a clear view of "the capillary vessels." With such a glass I have seen them in the cat. Now Harvey saw and described the "punctum saliens" of the egg, with what he calls "perspicilli." (*Harveii Opera*, Royal College of Physicians' edition, 1766, page 249.) And on page 255 he says: "Clariori tamen luce, perspicillis que adhibitis," etc. And again, page 267: "Apparuit (perspicillis utenti) in cervice, venæ ad cerebrum ascendentes quasi punctum sanguineum."

Harvey was in the habit of using a double convex lens. He describes one of manifestly greater power than those used in common spectacles; for, on page 338, *Harveii Opera*, he says: "Quippe radiis solaribus per exiguum vitrum transmissis, et in conum unitis, igne conestim excitato."

According to Boerhaave, Swammerdam had recognized the blood corpuscle in 1658. (See Tyson *On the Cell Doctrine*, page 16.) He must have used a very far higher power than enables one to see the capillary vessels. Now Harvey died in 1657.

The opinion held and expressed by the above-mentioned writers is, perhaps, predicated on that which we find in the life of Harvey, written by Doctors Lawrence and Akenside, and published together with his works, under the auspices and by the authority of the Royal College of Physicians of London, in 1766. This work, received everywhere now as authority in matters concerning Harvey, has these words on page xiii., *Harveii Vita*:—

"Duo sunt quidem, ut nequid dissimulemus, quibus in ratione sanguis circumferendi explicanda Harveium defecisse dolemus. . . . Arteriarum etiam minutarum cum venis conjunctionem primum pernegavit; eandem postea invitus agnovisse videtur, nec tamen rem penitus intellexisse." And on page xxix, "Concedit arteriarum propagines minimas inter venarum tunicas ita posse perrepere, ut sanguis in venas obliqua tradatur via, quali scilicet ureteres in vesicam, et ductus choledochus in intestinum progrediuntur."

I take leave to state, with the greatest diffidence, that a contrary opinion is forced upon me, after an extended examination of Harvey's works. I take leave further to state, that, in using the words "porositates carnis," found in the short fourteenth chapter of his work, *De Motu Cordis*, etc., Rotterdam editions of 1648-1654 and 1661, by Arnold Leers, and London edition of 1661, by R. Danielis; and in his second letter to Riolanus, Rotterdam edition, 1661, page 277, where Harvey sums up his views on the circulation, and traces the blood through the arteries into the "porositates," and through the "porositates" into the veins, and through the veins into the heart, Harvey more clearly expresses the true idea of the transit of the blood from the arteries to the veins than is now conveyed by the expression "capillary system of vessels." The word "capillary" relates only to the hair-like appearance of the vessels, while "porositates" translated into plain English would be "ferries," and relates to an *exact function*, namely, that of passing the blood in *one direction only*, that is, from the arteries to the veins. Now, these "ferries," the ferry vessels, the

ferry system of vessels, under the designation of "porositates," Harvey points out and dwells upon.¹

In this fourteenth chapter Harvey writes: "Quod sanguis, per pulmones et cor, pulsu ventriculorum pertranseat, et in universum corpus impellatur et immittatur, atque in venas et porositates carnis obrepit, et per ipsas, undique de circumferentia ad centrum, ab exiguis venis in majores remeet." And so in his second letter to Riolanus, page 277, Rotterdam, 1661: "Nempe de auriculâ dextra, in ventriculum, de ventriculo per pulmones, in auriculam sinistram, inde in ventriculum sinistrum et in aortam, omnesque per arterias à corde, per partium porositates, in venas, et per venas, ad cordis basin, quam celeriter revertitur sanguis." Surely it is manifest here that Harvey places a *tertium quid* between the arteries on the one side and the veins on the other side. He calls this *tertium quid* "porositates carnis" and "partium porositates." He meant to convey the idea, and with force he does convey the idea, that the "porositates" take the blood from the arteries, and through the parts, and into the veins. The position in which Harvey places the word "porositates" and its derivation, and its being used in the plural number, all these considerations force me to believe that he used it knowingly and in preference to any other word, such as *ductus* or *capillares*, and as conveying the meaning that the blood made the transit from the arteries to the veins, and in one continuous direction, and through vessels with sides to them, and that the blood did not return through these vessels, namely, through the porositates from the veins back into the arteries; the word "capillares," or *ductus*, embracing no such meaning as that a return of the blood could not take place.

First, then, in regard to the places where Harvey uses it. We find he always uses it in speaking of the passage of the blood from the arteries to the veins.² Thus in chapter VII., *De mortu cordis*, Rotterdam, 1648, page 97, "Denique clarè apparet assertio nostra, continuè et continenter sanguinè per pulmonum porositates permeare, de dextro in ventriculum sinistrum," etc. In chapter XI. page 126 "(vel per anastomosin immediate, vel mediate per carnis porositates, vel utroque modo), transire ab arteriis in venas." In the Rotterdam edition of 1648, the two letters to Riolanus do not appear, having been written at a later period; but these letters are in all the other editions to which I have alluded. Now these letters were written by Harvey for the purpose of explaining further his views concerning the circulation, and should be taken as of equal force with the text.

¹ I use the word ferry, Saxon *faran*, to pass, in its original sense, that in which Spenser uses it, "Him to ferry over that deep flood." And in Shakespeare, "The melancholy flood, with that grim ferryman, which poets write of, unto the kingdom of perpetual night" (Richard III.). In this sense the word does not comprehend a return.

² One exception to this is found in the letter to Slegel, and will be mentioned hereafter, where, by the departure, Harvey further and forcibly gives his meaning.

In the first letter, on page 189, we find, "Non enim tanto sanguine quantum pars quaeris in suis arteriis, venis et porositatibus ubique continet, pro alimento utitur." And on page 191, "de porositatibus in venulas." And on page 193, "Verum amplius, quod ipse sanguis è porositatibus partium regrediatur," etc. And on page 268, and in the second letter, "ut exinde fluxus sanguinis et citatior cursus, per arterias exiles, partium porositates, venarumque omnium ramos, necessario fiat, et exinde circulatio."

In the second letter, page 277, we have, in the three editions I have mentioned, "Omnesque per arterias a corde, per partium porositates, in venas, et per venas, ad cordis basin." In the Royal College of Physicians' edition, page 138, the comma so emphatic after porositates, and also that one after per venas, are both omitted. Manifestly by so doing a distinction, an emphasis is done away with, and that, too, in a place where Harvey was very explicit. Again in the fourteenth chapter of Harvey's text, and in the four editions I have alluded to, which are the only ones I have access to, but which in this chapter are uniform, totidem verbis et syllabis, we have "et immittatur, atque in venas et porositates carnis obrepatur, et per ipsas, undique de circumferentia ad centrum." In the Royal College of Physicians' edition of 1766, page 65, we find that the comma after ipsas is omitted, and that the word "venas" is inserted between ipsas and undique, thereby changing the meaning of Harvey. Surely these are grave errors, made by the learned editors.

To show both the onward course of the blood, as well as the continuous walls of the vessels in which it flowed, Harvey says on page 168 (Rotterdam edition, 1661), "Adeo ut ultimae divisiones capillares arteriosae videantur venae, non solum constitutione, sed et officio." In plain English, "So that the ultimate capillary divisions of the arteries appear like the veins, not merely in constitution, but also in function." On page 141 (Rotterdam edition 1661), "Nam duos contrarios motus in capillari propagine, chyli sursum, sanguinis deorsum, [in]convenienter et [im]probabiliter fieri existimare necesse esset." In English, "Two contrary motions in the capillary set, chyle going one way and blood in the reverse way, can not well exist." Harvey well knew that if "ductus" and "capillares" would permit possibly of a current in one way and then in the reverse way, "porositates" would exclude such an idea. He knew that "porositates" would convey the sense its derivation entitles it to, and no other. The word has a Greek root, with a Latin termination, in the feminine gender. The root is *πορος*, the verb is *περαω*, to drive right through, to pass through, to traverse; *περαω εἰς Ἀΐδαο*, Homer says, to reach the abode of Hades. This word is never used by the ancient writers, so far as I know, as expressing or comprehending any idea of return.

Πορος the noun means a *ferry*, a passage. Thus Æschylus speaks of *πλουτωνος πορος*, the Stygian ferry. Pindar sings *Βιον πορος*, the stream of

life. Pindar and Æschylus speak of πορος Ἑλλης, the Hellespont. Pindar says πορος σκαμανδρου, the Scamander. Πορος Νειλου, the Nile. There is no reflow, no reverse tide in these rivers; they flow towards the sea.

But the Euripus, the strait on the east of Greece, is not spoken of as πορος Ευριπου, for here the water flows through and then reflows at stated intervals, to which facts the ancients often allude. These old writers use the word πορος with exactness and precision in describing the continuous current of the classic rivers of antiquity; so, too, Harvey, with great taste and meaning, used it as pointing out the ever onward flow of the tide he wished to demonstrate.

Doctor Robert Willis has given the English word "pores" as the translation of Harvey's Latin word "porositates," thus for "atque in venas et porositates carnis obrepat, et per ipsas, undique de circumferentia ad centrum, ab exiguis venis in majores remeet" (see fourteenth chapter Rotterdam edition 1661), Willis has, "where it (the blood) makes its way into the veins and pores of the flesh, and then flows by the veins from the circumference on every side to the centre, from the lesser to the greater veins." (See works of Harvey, page 68, edition of Sydenham Society.) And for "omnesque per arterias corde, per partium porositates in venas, et per venas, ad cordis basin, quam celeriter revertitur sanguis" (see second letter to Riolanus, page 277 Rotterdam edition, 1661). Willis has, "whence by the arteries at large through the pores or interstices of the tissues into the veins, and by the veins back again with great rapidity to the base of the heart." (See works of Harvey, page 138, edition of the Sydenham Society.)

It is a grave error to attribute to the word "porositates" a loose and secondary sense, such as belongs to the English word "porosity." This sense would not likely be in the mind of those who used the word when it was still comparatively a recent one, and when its derivation was still fresh in men's minds, and when the Greek authors were studied by physicians and all other scientific writers. It is an error to suppose the word bore a mere abstract meaning corresponding to its abstract form, and that it indicated no more than a mere spongy quality in the parts of the body through which the blood passed from the arteries to the veins. In Harvey's age the idioms of the best Latin writers were more or less cultivated. The fact, too, that nouns abstract in form were nearly as often concrete in sense as not, shows that Harvey's words were not open to this misconception. For it was well known that Cicero spoke of "magnas clientelas" when he meant "multos clientes." And that when Tacitus spoke of "familiaritates ejus" in the case of Agricola, he meant "familiares ejus." A multitude of such cases could be alleged. Especially is the plural use of the word to be observed as decidedly militating against the notion that it was used by Harvey in an abstract sense. A living tongue is kept supple by daily use; it is pliant; we find that a new tinge is often imparted to

words already in use, and by assimilating foreign idioms it creates new expressions for new ideas. The dead languages, on the contrary, are fixed, having been cast into moulds by races of men long since passed away; there is no change in them.

The modern word "porosity" is alloyed—it is below the standard of *πορος*. But because, in the stream of to-day, the word is changed, shall we be taught that the distant fountain was not clear, and possessed not the virtue once attributed to it by Harvey? And used, too, as it was, by him for many reasons, as conveying the meaning the ancients gave it? Well may Coleridge tell us that "the position of science must be tried in the scales of the jeweller; not like the mixed commodities of the market, on the weighbridge of common opinion and vulgar usage."

The further assertion of Drs. Lawrence and Aikenside, namely, that Harvey believed "the blood to be delivered in an oblique way into the veins, in the way the ureters proceed into the bladder, and the common choledoch duct enters the intestine," is an error, promulgated under the sanction of the Royal College of Physicians of London (unwittingly), and consequently received and believed, and has done more to cloud the view of Harvey's teaching on this point than any other agency of which I am aware. I do not believe that such a view could be taken by one properly construing Harvey's text, and taking, singular and combined, the meaning and intent of his words. The passage from which this idea is taken by the authors of *Harveii Vita*, is found in the letter of Harvey to his friend Paul Slegel, of Hamburg, and is dated London, April, 1651.

I have seen this letter of Harvey only in the Royal College of Physicians' edition of 1766. I will give my translation of the words of Harvey as found in his letter to Slegel in this edition; beginning on page 617 at the words "Quæris autem," and ending with the words "adigere queas."

"But you will ask what on earth is this contrivance? what on earth these ducts? Certainly the little arteries,¹ which are always smaller, shall I not say twice or three times, than the veins (which they accompany, and to which they gradually approach), and at length are lost in the coats of the veins: so that I may believe that the blood borne forward by them (the little arteries) flows slowly between the coats of the veins; and the same happens here, which becomes usual at the junction of the ureters with the bladder, and the biliary pores with the intestine. For the ureters are insinuated into the bladder obliquely and tortuously, and not in the nature of an anastomosis: affording now and then a way for calculi and pus and blood; so that by them you can easily fill the bladder with air or water; but by no effort can anything be driven from the bladder back into the ureter."

Now what does Harvey mean when he says "the same happens here which becomes usual at the junction of the ureters with the bladder?" What is it that happens there? Harvey goes on to say that it is the prevention of the return of water from the bladder to the ureters. To

¹ In using the word "arteriolæ" in this place instead of the word "porositates" as heretofore, Harvey increases the strength of his position in pointing out the continuous channels in which the blood flows in passing the periphery.

place any other construction or sense on this sentence is to do violence to Harvey's meaning; the whole context shows this. For it had been asserted by Riolanus and others that there was an anastomosis by conjunction, and that there was a reflow of the blood from the veins to the arteries after the manner of Euripus. Slegel calls Harvey's attention to these statements of Riolanus (see Harvey's letter to Slegel). Hence Harvey's reply to Slegel, in which he explains his (Harvey's) anastomosis, which he goes on to say is not by conjunction, "*per copulam*," but takes place by means of "*arteriola*." These are the vessels he had in his publications hitherto called "*porositates*," thus pointing out that in vessels with continuous coats, that is walled vessels, the blood progressed, journeyed to the veins. Then, he explains that there were other places in the body where there was no anastomosis, yet where water, pus, calculi, etc., could pass in one way, but by no effort could anything be forced back again; that this happened where the ureters enter the bladder, and where the common choledoch duct enters the intestine. Further on he repeats this simile, and refers to his letter to Riolanus. In chapter xiii. of his text Harvey had demonstrated that the valves in the veins prevented any return of the blood.

To sum up, then, from the testimony, we are forced to the belief that Harvey did have the means of seeing, and that he did know, and was the first to point out, that "order of sanguiferous vessels ending by uninterrupted continuity" in the arteries at one extremity, and in the veins at the other extremity; and that under the title of "*porositates*" he gave "the exact channels," *the ferry system of vessels* by which the blood passes from the arteries into the veins. This belongs to Harvey, and to Harvey alone.¹

From this view, then, of Harvey's writings, I ask the question, and I hope at some future time it will be answered, have not these great authorities—Willis, Huxley, and the Royal College of Physicians of London—done their illustrious countryman, Harvey, great injustice? For "have they been sufficiently circumspect? Have they sufficiently inquired into Harvey's meaning? Have they quoted his words faithfully?" If they have not, in what does their position before the world differ from that of Doctor Geynes (see Dr. Sieveking's Harveian oration, *Lancet*, vol. i., 1862), who, according to Doctor Munk, in his role of the College of Physicians, was brought by the Fellows to the bar of the College for venturing to question the authority of Galen, and made to recant or go to prison?

Let us indulge the hope that these gentlemen, like Dr. Geynes, will recant. Let us believe that the Royal College of Physicians of London, the special beneficiary of Harvey's trust, will not sanction the keeping of Harvey's name in a relation so false as that in which it has been placed

¹ Malpighi afterwards further elaborated the same subject. Malpighi, *Opera*. London, 1686.

in regard to the transit of the blood from the arteries to the veins. Let us hope the College will give the world a new and revised edition of his life and works, and, as this coin bears the image and superscription of the King, "Render unto Cæsar the things that are Cæsar's."

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ARTICLE XV.

IS CONSUMPTION CONTAGIOUS? By EDGAR HOLDEN, M.D., Ph.D., President of the Medical Department of the Mutual Benefit Life Insurance Company, Newark, New Jersey.¹

MORGAGNI quotes from ancient writers the evidences in favour of his own convictions that consumption should still, as before his day, be considered contagious. Laennec believed himself to have been inoculated with tubercle during a post-mortem examination. Andral boldly asserted his convictions in favour of the same doctrine; and Beale, in his work on "Disease Germs," p. 152, uses the following language:—

"Living tubercle germs will not be considered as very closely related to the contagious particles which are the active agents in the propagation of contagious fevers. There is, however, reason to think that particles of living growing tubercle exist sufficiently minute to be supported by the atmosphere and carried long distances, while there are many facts considered by many sufficiently conclusive to justify the opinion that tubercular disease of the lungs is at least in some instances contagious."

The latter guarded statement aptly expresses the views of many who believe in the doctrine, but feel that it is not yet proved. To simplify our study of the subject, it may be well to say that the question we now propose is, whether it is without direct inoculation communicable by one person to another. The researches of Villemin² on the *inoculability* of tubercle, and the subsequent investigations by Andrew Clark, Fox,³ Sanderson, and others, which showed that any septic material when inoculated may develop a disease of the glandular system akin to phthisis, are doubtless familiar. The real point being whether any septic material is eliminated from the body of a person suffering from necrobiotic changes in the lungs, which, floating in the air or transferred by contact, may develop the same affection in another person. We should still further simplify our inquiry if we use the words consumption, phthisis, and tuberculosis as synonymous, although, personally, I adopt without hesitation the modern views of a complete and radical difference between phthisis

¹ At the time of the appearance of the interesting article by Dr. Webb in the last number of this Journal, this article was almost complete.

² Edinburgh Med. Jour., Feb. 1837, p. 756.

³ Pamphlet, 1868. London.

and tuberculosis. For our present purpose, however, the distinction is unimportant, as if contagious at all it is chiefly so in the later stages, when the one may have merged into the other, and the latest stages, followed by death, will alone be drawn upon for illustration. The subject has received attention from many writers, and one Dr. Windrif, of Cassel (*Sydenham Year Book*, 1869, p. 126), quotes some interesting examples, of which the following are worthy of record:—

“A medical student at Berlin was found to have a rapidly developing phthisis, and went home to die. A foster-brother, in whose lineage no trace of consumption could be found, took his clothing, and continued to wear it after his brother's death. He began to have a slight cough, consolidation, softening, emaciation, profuse expectoration, and death followed within one year.

“A woman, æt. 35, had consumption. During her illness a twin sister of robust health began wearing her garments. She died just six months after the victim whose clothing she was using.

“A mother died shortly after delivery, and the monthly nurse continued with her from the delivery till her death. In her own family, on both sides, no case of like disease had occurred. She, however, died within the year following.”

Many other instances of like character, and particularly of husbands and wives, were given, and attention was called to the peculiar exhalation from the body of a consumptive in the third stage of the disease.

The prevalence of popular prejudice on this question is noticeable in many countries, and, perhaps, in none more so than in Spain, France, and Italy. The servants are fearful of the washing of the linen; they dread the sweepings of the rooms; and the landlords, after a death in their hotels, exact exorbitant sums for the use of rooms where victims have spent their final hours, to enable them to burn everything which could possibly preserve the elements of contagion. Carpets, bedding, and even the wooden chairs and bedsteads are sometimes so destroyed (if the statements of the landlords themselves can be accepted as evidence).

It is somewhat singular that the firmness of conviction in some minds is as strong as the opposite belief of others; yet where doubt must of necessity exist, it is less surprising than that two opinions should be possible regarding so contagious a disease as scarlet fever. I have heard a physician of considerably more experience than judgment gravely argue that this latter disease was neither infectious nor contagious.

To decide whether consumption is communicable it is not necessary, it seems to me, to find any specific microzymes which may have emanated from the body, and so have infected the atmosphere, or passed by contact so as to render their absorption certain to develop kindred disease. We have demonstrated the proposition without this if it can be shown that septic material of *any character* is cast into the atmosphere or presented to a healthy surface, and so produces disease akin to itself. To take any different position involves the question as to whether consumption is a zymotic disease, a point probably settled by the profession after the somewhat singular pamphlet left with Paget, by Dr. Budd, some years since, to be opened only under specific contingencies. Nor do we need the researches

that followed Villemain's experiments on the inoculability of tubercle; and the announcement that any animal material in a state of decomposition would develop the same affections of the lymphatic system as those that followed the introduction of the tuberculous matter, as groundwork on which to build our proposition.

"Is consumption communicable by the exhalations of the body excretory or secretory?" The affirmative answer to either of the two following questions ought to answer the question at issue:—

1. Do practical experience and observation seem to show that it is?

2. Admitting errors of clinical deductions, can the products of retrograde metamorphosis of tissue, as thrown off by the lungs and skin in consumption, produce in a healthy person the same, or other, or any disease? In other words, and simply, Can it and does it produce similar or any disease?

With regard to the first of these questions which rhetorically should precede the other, startling examples at times occur when the evidence seems almost conclusive; but the caution that must of necessity invest all the deductions from medical observation, urges the old and sarcastic *post hoc non propter*, and the question is again unanswered.

So many striking instances have occurred in my own experience as to induce an extended inquiry concerning the opinions of reliable physicians throughout the country; and with the assistance of several confreres this has been done by circulars addressed to every county, and to most, if not all, the important towns throughout the United States. The physicians addressed have been those only who were known to be the best in their respective localities, and their replies have hence been considered entitled to respect and confidence.

These number two hundred and fifty, being about one-half of those addressed. The result shows an almost equal division of opinion. It should, however, be noted that those whose attention has been much given to pulmonary disease quite frequently incline to the belief in contagion; while those, however eminent as scientific men, whose tastes lead them to other departments of medical science, adopt the now most generally accepted doctrine of non-contagion.

Out of the whole number whose views are recorded I have selected twenty-eight as standing above their fellow practitioners, and of these *eleven* believe in contagion, *twelve* do not, and *five* are not positive.

The general summary of view is as follows:—

One hundred and twenty-six answer *aye*. *Seventy-three* of these speak emphatically, and give cases in illustration.

Seventy-four answer *no*. Fifty are in doubt, or have had too little experience in pulmonary disorders.

There are therefore one hundred and twenty-six in favour, and the remainder positively or doubtfully against the theory. Perhaps to divide

the doubtful would be more fair, and to say that ninety-nine are against and one hundred and fifty-one in favour of it. In any case the difference is less than was anticipated, and may be considered a fair view of the professional opinion of this country on the subject.

The replies from different States are summarized as follows, and it will be observed that the States to which consumption is not indigenous are omitted. The reason of this is that in such States as Minnesota and Florida, for example, there seemed danger of obtaining facts without a fair and proper knowledge of collateral history and family tendencies, a matter of extreme importance.

State.	Replies.	Aye.	No.	Not observed.
Pennsylvania	47	29	15	3
Missouri	23	7	7	9
Iowa	23	9	5	9
State.	Replies.	Aye.	No.	Not sure.
Connecticut	4	2	0	2
Maryland and Dist. of Columbia	3	2	1	0
Kentucky	10	4	1	5
Wisconsin	10	4	5	1
New Jersey	7	4	1	2
Illinois	32	17	11	4
Ohio	32	20	9	3
Maine	7	4	1	2
New York	27	12	9	6
Michigan	9	3	5	1
Tennessee	14	10	3	1
Uncertain	2			

As the testimony of observation and experience is a positive testimony, and that of the doubtful non-observer is an assertion at the best but negative, some of the former can with benefit be submitted.

The following extracts have been selected somewhat at random, although but a small part of the whole.

Cases in the same family adduced in evidence are not given; as being liable to other plausible interpretation, *e. g.*, on the ground of heredity.

On the same principle those of near relatives are also excluded. (One or two exceptions, however, will be observed.)

Dr. McReynolds, of Clarksville, Tenn., says: "While not positive, my practice has presented instances of certain strong and seemingly healthful men having no traceable hereditary tendencies, who, after nursing their wives through long and tedious illness, have in a few years themselves succumbed to a similar sickness."

Dr. Todd, of Indianapolis, Ind., says: "My observations during a period of twenty-four years' active practice long ago convinced me that such was the case (*i. e.*, the disease is infectious). I have known a number of instances where parties with no hereditary tendencies or predisposition have, after long and intimate association with those affected, themselves fallen victims."

Scores of replies are indefinite; thus Dr. Fitzgibbon, of Washington, Ind., says: "A remarkably healthy woman, who had no hereditary predisposition whatever in her family, contracted consumption from her husband and died. She had several children, all delicate."

More satisfactory are the following: Dr. W. K. Mavity, of Kokomo, Ind., says: "Mr. H. married Miss F., who was apparently healthy in every respect, and free from any known hereditary disease. In three years Mr. H. was confined to his house and bed with consumption, lingered a year and died. In one year more the wife, who had borne a child and diligently watched and nursed her husband, was taken with the same disease, with less marked symptoms, however, at the onset, save a persistent, dry, hacking cough, and in less than two years died."

Dr. M. Hoge, of Cambridge, Ohio, gives cases of which the following is an example. "A gentleman of robust health, and constitution free from hereditary taint, *æt.* 40, had been married to a delicate consumptive lady. For the last two years of their married life she was much confined to her room. Her husband spent much time with her. Toward the latter part of her illness her health declined, and in two years after her death he also died of undoubted phthisis."

Dr. G. A. Way, of Caldwell, Ohio, gives three instances, in all of which the wife or husband followed their deceased partners in about a year, there being in neither of the cases any predisposing family taint.

Dr. Otis, of New Philadelphia, Ohio, gives the following case now under observation: "A lady lost her husband from consumption fifteen years ago. During all this time she had suffered at intervals from phthisical symptoms, although never prior to the illness of her husband, and there had never existed a case of consumption in her family. Eight years ago she married a second time, and gave birth to a child of marked consumptive diathesis, although its father was strong and sound."

Dr. David Rush, of Celina, Ohio, details several instances of the apparent transmission from wife to husband or husband to wife, and one of a student who, previously healthy and of healthy stock, appeared to contract the disease from a comrade with whom he was intimate, rooming, eating, and working together.

Dr. H. S. Smith, of Blandville, Kentucky, gives several cases, chiefly of husbands and wives, and one in which the victim was one of a large family of brothers and sisters (eight), none of whom were of even delicate habit.

Dr. E. D. Kittoe, of Galena, Ill., makes the following interesting statement: "I have frequently noticed the occurrence of death from this cause in persons who had cared for and nursed friends who had died of consumption, but who before doing so showed no tendency to it, and in whom there was no evidence of hereditary taint; for a marked case see the following. The late General J. A. R. was born and brought up near this city; his parents are both living at this time, remarkably robust and healthy; no case of tubercular disease has ever been known to have affected the ancestors of either father or mother.

"General R. was a remarkably strong and vigorous man, both mentally and physically, prior to his marriage. He married a Miss S. from Utica. By this union he had three children. Miss S. came of consumptive family, and the disease in the wife developed soon after marriage. The General was a very kind and attentive husband and nurse, and gave himself up almost entirely to that duty, staying often in a close room with her up to her death. After this, he was almost at once placed on the staff of General

Grant. I observed soon that he had a slight cough, and in the summer of 1863, after the siege of Corinth, he had fistula in ano, for which the usual operation was performed. He continued to have cough from that time forward. On the occasion of General Grant being ordered to supersede Rosencranz at Chattanooga, in crossing Waldron bridge, we were exposed to a heavy rain all day, and on arriving at Chattanooga the General's cough became very bad, with sanio-purulent expectoration. When he left with Grant for the Potomac, he was very thin, but his indomitable energy kept him up. At the close of the war, he was in a well-defined tubercular condition, and gradually gave way till he died."

A singular fact is here discovered. This history of General R. is, by a remarkable coincidence, taken up by another physician, from another State, and entirely without the knowledge the one of the other, and is thus elaborated by the latter:—

Dr. Bennett, of Danbury, Conn., says: "About three years before he (General R.) died, he again married—a Miss H., none of whose family have any tendency to consumption. He died of consumption. The second wife also died, in a year or eighteen months after, of the same disease. She bore him two children of feeble constitution, which died in a day or two after birth. The family believe that the disease was transmitted from the first wife to the husband, and by him to the second wife."

Dr. J. N. Barnes, of Decatur, Ill., gives the following succinct account of a case: "A married man, after a few years' sickness, died with hereditary consumption. A few months after his death, his wife, who had nursed him, although previously healthy and vigorous, and with nothing hereditary as far back as her lineage could be traced, and without having taken cold or other apparent exciting cause, except exhaustion from care and nursing, took consumption and died."

Dr. G. W. Jones, of Danville, Ill., gives a considerable number of instances, of which the following are the most interesting:—

The husband of Mrs. C. A. L. died of phthisis. For three or four years after this she suffered from all the symptoms of the first and second stage. She has fully recovered, and by a second husband borne a large family of fine healthy children. The disease is not in her ancestry at all.

Mrs. C. M., of very fine family record. Husband died of phthisis in May; her attention had been unremitting. She died of phthisis the following April, and is the only one of her family who ever had the disease.

Mr. —, of very fine record; wife died of phthisis four or five years since. He presents now the physical evidences of the disorder, and travels north or south with the seasons. He was his wife's constant companion and nurse.

Many observers make the statement that in no instance have they seen the disease communicated from wife to husband, but only the reverse, and some boldly assert that through conception and the rearing of children alone is it conveyed.

Dr. W. M. Chambers, of Charlestown, Ill., gives three such instances, and one where the surviving son of such conception himself married, and appeared to convey the disease to his wife, whose family was free from consumptive taint. Other observers, however, give cases where the hus-

band appears to have become affected by the marriage. Dr. B., of N. J., gives such an instance in a young man of twenty-four, who was without suspicion of consumptive taint, and from a family equally free.

A few cases are herewith tabulated, as of similar character and interest. First, those like that of General J. A. R., given above. Thus Dr. J. W. Hoff, of Pomeroy, Ohio, says:—

“Recently I knew a wife to take and die of consumption; in one year it was fully developed in her husband. He married, however, and died within a year thereafter. His second wife followed him with the same disease, and also their babe. In the past thirty years, I have seen many undoubted instances of its infectious character, and, I believe, the female will contract it the more readily from the male than *vice versa*.”

Dr. L. McDowell, of Flemingsburg, Ky., says he knew a man who had all the external appearances of a tuberculous diathesis, who married a healthy girl of eighteen. In three years (after the birth of her second child) she died of tuberculosis. He married in a year and a half again, and to an exceedingly robust woman, of a family without taint. In less than two years she died of unmistakable pulmonary consumption. The third time he married a healthy woman. He himself died in twelve months after his third marriage with consumption, and his widow followed him in six months with the same disease.

Dr. W. C. Bennett, of Danbury, Conn., says: “Mr. H. D., of Bethel, was healthy and of healthy family, with no known tendency to consumption. His wife died of the disease. He married again, and soon afterward sickened and died of the same. The second wife then sickened and died of consumption. They all lived and died in the same house, in an apparently healthy location, and probably used the same bedding. I doubt if the second wife bore him children; but of the two children of his first wife one is dead of consumption, and the other far advanced in the same disease.”

Dr. A. F. Gillette, of Lyons, N. Y., gives the following interesting history of a family by the name of Root. There were five sons and three daughters.

Joel died of pulmonary disease; wife now living.

Tiler died of pulmonary disease, but married after he became ill, and his wife, although without family tendencies to the disease, died of it. He married again, and his second wife died in the same manner, she being the only case in her father's family.

Darwin died of pulmonary disease; his wife followed him with same disease, and her family also was free from taint.

Frederick now living, but has laryngeal trouble.

Andrew died of acute bowel difficulty.

Mary and Elmira died of pulmonary disease.

Eveline married, died of consumption, and was followed by her husband, whose family had never shown hereditary difficulty, being strong, long-lived, and of a robust race.

The following remarks are interesting, as bearing upon those cases not related by marriage or relationship.

Dr. Inglis, of Detroit, an acute observer, after saying that he had not

seen indubitable evidence of contagion in his practice, continues, "I have, however, in the wards of Prof. Frantzel in the Vienna General Hospital, seen such striking cases explicable in no other way as to make me believe that the disease is communicable when persons are confined to constant inhalation of the breath of consumptives without sufficient out-door air and exercise."

Dr. W. H. Webb, of Philadelphia, says: "In January, 1874, I attended a lady who had phthisis; her family, which was long-lived, presented no history of that disease. She had been in constant attendance upon a lady friend during the winter and spring of 1873, who died of consumption in May of that year. My patient died in March, 1874."

Many of the reports are non-committal, and yet of interest.

Dr. H. J. Rice, of Rockville, Ind., says: "I have seen no cases free from doubt. In the case of husbands and wives I have universally observed that where one of the parties suffered with phthisis, the other was in a condition of impaired health, with decided symptoms of the disease. The nutrition of the system is diminished, the appetite fails, there is cough, etc., symptoms which usually pass off upon the death or recovery of the party first affected." He then proceeds to speak of the effects of watching, anxiety, etc., as possibly the causes of this impairment of health.

Dr. J. W. Randall, of Albion, N. Y., cautiously speaks of the influence of an advanced stage of the disease on those broken by long watching and anxiety, but gives the following instances confirmatory of the contagion theory.

Two men of healthy family, and free from any records of consumption, married into consumptive families; in both instances the wives died, and the parties, with some of the children, have followed within a brief period.

Two other instances also, the one of a rugged and healthy woman, and the other, a robust man, both married consumptive companions. Both the latter died; but the former, after varying experiences from cough, hemorrhages, etc., had enough vitality remaining to rally, and regain very good health.

Dr. H. P. Clark, of Ashland, O., after giving instances of apparent contagion and cases of recovery where a strong constitution enabled the parties to survive the period even of softening and cavity, proceeds to question the accuracy of the observation, and to doubt whether other influence than contagion may not have predominated.

The instances adduced of wives contracting consumption from their husbands, when the careful investigation of family history showed a remarkable freedom from hereditary taint, and the same of husbands contracting the disease from the wives, are too numerous to mention.

Dr. C. E. Beardsley, of Ottawa, O., gives several cases of interest.

Dr. G. E. Corbin, of St. John's, Mich., gives also several as an emphatic evidence of his convictions.

Dr. H. V. Passage, of Peru, Ind., gives an interesting case of a rugged,

healthful woman, whose consumptive husband regained his own health, and seemed to transfer his disease to her.

Dr. H. Brubaker, of Somerset, Penn., gives three instances, in all of which the second victim followed the first within a year, there being no similar disease in the families of the latter.

Equally numerous also are the cases where the disease once started in a family appeared to affect one member after the other, and although such cases at once suggest the development of a diathesis under circumstances common to all the family, and therefore not suggestive of contagion, it is by no means certain that they are not valuable in answering the question propounded.

Dr. D. W. Crouse, of Waterloo, Iowa, for example, writes as follows :

“In a family where three daughters were much attached to each other, one who had been some time absent came home to be nursed by her sisters, she having consumption. One of them showed the evidences of the disease at about the time of the other's death, and died within a year thereafter. The second sister, who then became nurse, contracted the disease, and is now rapidly failing.”

“The wife of a lawyer of my acquaintance came home to be nursed by her mother and husband. The mother soon after began to show evidence of consumption, and followed the daughter in about six months. It is now two years since the death of the latter, and the husband is failing perceptibly, showing evidences of softening, and the other accompaniments of the third stage.”

Dr. Anson Hurd, of Finley, O., says : “I am a recent convert to the doctrine of contagion, but I cannot, in the limited space allowed me, give more than the following instance : viz., the M. family. Father, mother, and son. The son died one year before the mother ; the tendency being inherited from her. The father, a robust man from robust stock, in whose parentage back for two or three generations there had never been any case of consumption, tubercular or scrofulous affection, died one year after his wife, and two years after the son. He nursed the latter (an only son), also the wife, attentively, sleeping frequently in the same bed. He began to cough, show signs of elevation of temperature before the wife died. He said, ‘Doctor, you need not deny it ; consumption is catching, and I have caught it from my wife or son, and shall die of it.’ And he did ; the disease developed rapidly with all the signs and characteristics of true consumption.”

Any further quotations would only prove wearisome repetitions of similar facts.

The already large number has been thus drawn out to show impressively the grounds upon which convictions appear to have been based.

We cannot shut our eyes to the fact that startling cases do present themselves, which seem to confirm the theory of contagion or infection.

Starting originally in practice with the belief that consumption is communicable only from parent to offspring, I have for several years been convinced that there is great danger in too close contact with those in the latter stages, and for a more positive view have instituted the present inquiry.

I can enumerate at least a score of cases which have been watched with this very object in view, and in which the result has been the same. Wives after husbands, husbands after wives, intimate companions and faithful nurses, who slept in the same bed, or wore the same clothing, have fallen victims. Of course it is not to be intimated that all, or even a majority, can be affected by contagion any more than in those diseases now indisputably contagious. Malignant scarlet fever, diphtheria, and cerebro-spinal meningitis are braved by faithful nurses and friends who escape in *more* than a majority of instances.

To prove contagion is no easier now than when erysipelas had its defenders, and the records of the surgical wards of the hospitals of Paris and Berlin and London had accumulated a fearful mortality ere the obdurate prejudices of the profession were awakened to a new belief.

The records of the great hospital for consumptives at Brompton may with propriety be here alluded to, and none the less so because they enable us most conclusively to eliminate from our inquiry one point of interest, viz., the possibility of infection through the atmosphere, where ventilation is observed.

These statistics were prepared by Drs. Cotton and Virtue Edwards, and show that of the numerous nurses and attendants engaged during twenty-one years, only one nurse and one servant, and no chaplains, matrons, secretaries, or even porters who carried out the dead, had died from consumption. Two dispensers, however, fell victims, but in one it was not clearly traceable to his stay at the hospital, and indeed appeared to develop only after his change to some other occupation. Now we accept these facts as conclusive against infection *where ventilation is perfect*, and if we may, as I believe we should, draw a sharp line between infection and contagion, we may dismiss atmospheric poison at once from the case, and look to the influence of contact as the source of danger.

At Brompton the patients and attendants never were so intimately associated as to test the danger of contact, as by sleeping in the same bed, the wearing of the same clothing, etc.; and as regards our practical view of the question, and its bearing upon husbands and wives and brothers and sisters, the statistics give no light.

We shall therefore not again in this essay use the words contagion and infection as synonymous.

Now to return to our original proposition. Do practical experience and observation *seem* to show that consumption is contagious? We must answer, they certainly appears to do so.

For the second part of the original query, admitting errors of clinical deduction, *can* the products of retrograde metamorphosis of tissue, as thrown off by the lungs and skin, produce in a healthy person the same or other or *any* disease? We may simply paraphrase by asking, If it appears

to be shown by practical experience, is such contagion compatible with the pathological possibilities?

We are at once brought into contact with the inquiry as to the essential element of consumption and its origin. If it may be due to the character of the soil and deficient drainage, as maintained by some, and it is indubitable that the disease favours a locality whose subsoil is clayey, then the mere fact of two persons being exposed to a similar influence is brought forward against a possible contagion emanating from the first one sick; but may not this be urged against any and every disease now admitted to be contagious—typhoid, yellow fever, diphtheria, scarlatina, etc.? It appears invalid as against more direct testimony.

Dampness, variable temperature, and indeed any and all conditions common to the sick and well, must be dismissed in like manner; since if these be assigned for any given case where a well and strong person has been exposed to the influence of the sick, a valid answer would be that others equally well did not succumb, or that, as in many of the instances given, the same person had been a constant resident of the locality without detriment. Of the various theories maintained by writers with more or less tenacity, none is more difficult to withstand as an argument against contagion than that of MacCormac, viz., the “breathing of rebreathed air.” Since if the simple breathing of exhaled air from healthy lungs loaded with the products of a normal excretion would suffice to produce consumption, the confinement of the frequently closed rooms sought by those ill with the disease, together with the anxiety and watching of the one acting as the attendant, would be at once a sufficient reason for its outbreak in him or her, aside from the exposure to the person already ill. In answer to this we would say that if healthy lungs yield a sufficiently vitiated atmosphere to develop disease—and we admit that one of the chief elements of the disease, viz., impaired nutrition, is favored thereby—how much more would this be the case when the air is contaminated by the exhalations from necrobiotic tissue.

Now we have not simply to deal with an impairment of nutrition, such as might arise from neurotic or hæmic changes, but a specific disease, the actual morbid element being yet unknown to us in spite of the years of arduous scientific labour spent upon it.

Cases, moreover, do occur of apparent contagion among husbands and wives when every attention is given to ventilation and pure air, it being evident however that *absolute* purification would diminish the probability of contagion as it clearly does in cases of variola.

We need not, however, dwell upon the various theories advanced as to the origin of consumption; since, even if we assume it to be local and inflammatory, there must yet be behind that, something which determines its subsequent difference from a simple inflammation, and an inherent some-

thing even, which decides whether the products of inflammatory action shall be absorbed or undergo caseous degeneration.

To my own mind, after careful study of the subject, as well as of the views of eminent authors, nothing is more clear than that the disease is, in its very earliest incipency, clear back of any untoward development, an integer of the bioplasm of the blood, just as certainly as the Roman nose of the Polish Jew is an essential element of the ovum or spermatozoon of his progenitor. This is the opinion of Dr. C. B. J. Williams, whose able exposition of the view may be found in his work on Consumption. It is, it seems to me, the only rational hypothesis, and reaches the "reiz" of Virchow, and the primitive departure from a normal condition alluded to by Southey in his "Nature and Affinity of Tubercle" as the "rift within the lute which by and by will make the music mute."

Even with this hypothesis we are yet unable to say in what this change of the bioplasm consists; still, if it is admitted, then we ask what external influences may so change the character of the blood? Those which result in rheumatism and gout have been studied with such success that remedies have been brought to bear upon scientific principles; and, although we do not feel that the development of uric and lactic acid, as causes, has been satisfactorily proven, the external influences that produce the change are well known, and the theory is in a therapeutic sense sustained.

As in rheumatism, we know what external influences will develop consumption, and that these influences work with greater certainty upon a person predisposed thereto. We may go further, and say that as many supposed healthy persons carry for an indefinite time the pulmonary states which afford favourable soil for the disease, they are predisposed in other senses than by mere heredity. Among these influences are anxiety, loss of rest, wearisome watching, and impure air; and we purposely come back to the strongest argument against the individual instances of supposed contagion that has yet been urged, viz., that *not* contagion, but this very watching and anxiety, etc., adequately explain the facts. Unfortunately for this explanation, experience shows that all these are exaggerated; the apparent contagion occurs where the exposed parties are far from being troubled by anxiety or watching, and where ventilation is most carefully observed. Of this fact I am convinced by clinical experience, several of my own cases being only confined to the room or bed for a few days, and requiring no especial attention; and in one case particularly, the wife was rather impatient that her husband delayed so long his going off.

This, however, is a digression; change in the blood, whether from malnutrition or mal-assimilation, and the operation of external influences being admitted, may one of these external influences be the exhalation from lungs by respiration, or from the body by perspiration of a consumptive? To carefully purify the water in a spirometer, and allow a large number of consumptives to breathe through it, seemed to be a sure method

of obtaining the disease-germs, if such existed. The water, after a reasonable time, swarmed with bacteria and germs of organic life; but, unfortunately, a similar condition resulted when only healthy persons had respired in the same manner, and it became at once evident that the germs might belong to the air, and were not of necessity obtained from the respiratory tract.

Putrefactive changes, however, occurred far more rapidly in one than the other, and odours of a sickening character emanated sometimes almost immediately from the water used by the consumptives.

This method of investigation, therefore, offered no more satisfactory result, and was discontinued. The evidence of some influence favouring putrefactive changes having passed into the water, however, suggests that possibly careful search might show the *microsporion septicum* believed by Klebs to be the fungus which gives to pus an infectious character (Wagner, *Man. Gen. Path.*, p. 106), or some other microzyme as yet unnamed. The failure thus far to find a definite fungus is by no means any evidence that infection may not exist in this very quality which favoured the early putrescence of the water, since the germ theory of contagion is far from being proven, and the chemical theory is full as ably supported.

Orth, although favouring the former, yet shows that destruction of the bacteria of infectious liquids does not wholly destroy their infectious character (*Arch. of Exp. Path.*, 1873, p. 81). Not to further pursue the question of transmission by atmospheric agency, which, as has already been stated above, is weak and almost positively negatived by the experience of the Brompton Hospital, we may with more interest and profit study the influence of direct contact.

In reviewing all the cases collected, it cannot fail to be noticed that the best authenticated ones are those of husbands and wives who have slept in the same bed, of brothers or friends who have worn the same clothing, or of women who have borne children to consumptive fathers.

The most positive among the non-contagionists almost invariably qualify their assertions by the advice to their brother-physicians not to allow the consumptives to sleep with healthy persons.

And Dr. C. B. J. Williams, one of the most lucid writers on consumption of modern times, after emphatic denial of the possibility of communication of the disease from one person to another, ends with the following contradiction: "I yet think that both reason and experience indicate that a noxious influence may pass from a patient in advanced cases, . . . and may produce the same disease." Not may produce disease, but *the same* disease.

The influences that emanate from the body of a consumptive are such as must of necessity accompany increased elimination of the products of retrograde metamorphosis. The lungs crippled in their power to do their share, and the rapid chemical changes going on in the tissues to render an

increased elimination necessary, the skin is called upon to do a double duty; not only is it relaxed and devoid of its power to equalize the temperature of the body by its steady elimination of insensible perspiration, but it pours out its discharges upon slight exercise or nervous excitement, and in the latter stages drenches the failing patient with the colliquative sweats so unmistakable and alarming.

That this sweating is always the reaction of pyrexia can hardly be for a moment maintained, as it occurs frequently without previous elevation of temperature; yet, when it is the sequela of fever, it must be the more heavily laden with the débris of a malnutrition which cannot fast enough be rid of its own ashes (if we may thus intrude so suggestive a metaphor). That this sweat must be so laden, we cannot doubt; it is drawn directly from the circulation, it is prone to rapid decomposition, and is to the senses as suggestive of decay as it is possible to be.

Evaporation of its watery constituents deposits its excrementitious solids on the sheets or the clothing most immediately in contact with the body. That these are in small quantities is of course conceded; the solids of normal perspiration are less than half of one per cent. of the fluid itself. According to Favre, as quoted in Flint's recent *Physiology of Man*, careful analysis gives the following in 100,000 parts:—

Water	995.573
Urea	0.043
Fatty matters	0.014
Alkaline lactates	0.317
“ sudorates	1.562
Chloride of sodium	2.230
“ potassium	0.244
Alkaline sulphates	0.012
“ phosphates	a trace.
“ albuminates	0.005
“ earthy phosphates	a trace.
Epidermic debris	a trace.

Now, in comparison with this, an analysis of the sweat from patients in the last stages of consumption would be instructive, but the difficulties in the way of an analysis involving such infinitesimals have prevented its completion. I have been able only to determine the fact that the albuminates, sudorates, and urea exist in greater quantity, as might have been inferred, and that the perspiration is more truly excrementitious in character than normal.

The quantity of this eliminated material is small; yet the long continuance of the process would, in my opinion, supply a sufficient accumulation of it to endanger a healthy person.

The question as to the absorbent powers of the skin is settled by physiologists, and indeed is easily proven. The fact that the health of a well person will deteriorate under the nightly contact of an invalid, what-

ever be his disease, and that a healthful child will grow ill from like association with an elderly person whose vital powers are failing, *without* active disease, are matters of daily experience; and the conclusion that personal contact, if intimate and continued, with one who has both active disease and failing vitality, will not only deteriorate health, but actually produce similar disease, is more than plausible, indeed is proven by the following conclusions of our argument:—

1st. The general experience we have drawn upon favours such belief.

2d. Most authorities, even among the non-believers in infection, concede such danger from intimate contact; and—

3d. Such a theory harmonizes as no other can the opinions of careful observers.

To epitomize concisely, therefore, we believe that consumption is communicable in its later stages by means of soluble excrementitious matter thrown off by the skin and deposited on the bedding and underclothing, or in any other manner brought into contact with the naked surface of a healthy body; and that, although in some instances this may be thrown off without development into new disease, it is yet very liable to be so developed, and more liable where the healthy person is by heredity or depression in a favourable state for its reception; and, finally, that the idea of infection or communication by the atmosphere is not sustained, and is rare even if it is possible.

13 CENTRAL AVENUE, NEWARK.

ARTICLE XVI.

ON THE IMPORTANCE OF COMBINING MORPHIA WITH QUINIA IN THE TREATMENT OF MALARIAL FEVERS. By MERIWETHER LEWIS, M.A., M.D., of Lenoir, Tennessee.

WITH many physicians it is an established principle of therapeutics, that whenever there is physical pain it is always a good and safe indication to relieve it. Acting upon this principle from the very beginning of my practice, I soon became fully convinced of its importance, and, consequently, morphia has ever since stood high upon my list of favorite therapeutic agents.

As my patients frequently complained of severe pain during attacks of intermittent fever, I soon began to combine morphia with my prescriptions of quinia; without expecting, however, any further benefit from the opiate than the temporary relief of pain. Carefully observing the effects of treatment, I began to notice that the patients who received morphia in addition to the general treatment recovered more rapidly than those who did not take the opiate. In 1872 I had just located at Lenoir, where

malarial fever was then prevailing to an extent hitherto unknown. With such clinical advantages before me, it required but a short time to establish the conviction in my own mind that a ten-grain dose of quinia combined with a third- or half-grain dose of morphia would break up an attack of intermittent fever with far greater certainty than would a twenty-grain dose of quinia alone.

Another consideration also induced me frequently to combine morphia with quinia. Hydrobromic acid had not then been introduced; and as anything less than fifteen grains of quinia proved, when given alone, utterly inefficient in the treatment of severe cases of malarial fever, my patients were often affected with distressing *tinnitus aurium*. But combining the morphia and quinia, I found that severe cases of malarial fever could be relieved by one-half of the former dose of quinia; and that, owing to the comparatively small dose required, there was perfect immunity from all the annoying cerebral symptoms resulting from the administration of large doses of the sulphate of quinia.

For six years I have carefully studied the comparative value of quinia, with and without morphia, in the treatment of intermittent and remittent fevers. Indeed, I have kept an unbroken record of the diagnosis and treatment of every case for which I ever prescribed or operated, varying, of course, in extent and fullness with the interest and importance of the case, but always sufficient to show the nature, treatment, and result, no matter how trivial the case should appear.

Looking over these records, since Aug. 1872, I find that I have treated, prior to Jan. 1878, 461 cases of malarial fever. Of these cases, 317 received (exclusive of the general treatment which was the same in all the cases requiring it) quinia and morphia combined, either in powder or in aromatic sulphuric acid: while 144 cases were treated, as nearly as possible, in the same way, but without any opiate whatever. The average number of chills occurring subsequent to date of attendance in the cases treated on the combined plan was $1\frac{12}{317}$; while the average number in the cases treated without morphia was $3\frac{13}{144}$. These results show the great advantages of the *combined treatment* over the administration of quinia alone.

In regard to the *modus operandi* of the opiate in such cases, I deem it unnecessary to offer any remarks, but will simply formulate the conclusions to which I have been led by the study of the records of my cases.

1st. The combination of an opiate with quinia insures an earlier and more complete cure of intermittent and remittent fevers, than quinia alone; 2d. Less quinia is required, and hence there is less cerebral disturbance; and, 3d. Any paroxysm of intermittent or remittent fever may be aborted by the use, at the proper time, of a *decided dose of morphia and quinia* with reasonable certainty.

REVIEWS.

ART. XVII.—*Claude Bernard and his Physiological Works.*

CLAUDE BERNARD was born on the twelfth of July, 1813, and died on the tenth of February, 1878, in the sixty-fifth year of his age. About the year 1834, a young man hardly twenty-one years of age, he entered Paris, bringing with him a tragedy. In his native village, Saint-Julien, near Villefranche (Rhône), he had studied pharmacy. Aspiring to fame in the world of letters, he had written a *vaudeville* which had been played at Lyons. Dissuaded by Saint-Marc Girardin from the course which he had marked out for himself, he entered upon the study of medicine soon after his arrival at Paris. In 1839 he was admitted an *interne*, having been successful in the *concours*, into one of the hospitals of Paris. The practical work of his profession, however, failed to satisfy the full measure of his aspirations, and he did not find in it the vocation to which he was destined. Although he published, in conjunction with Huette, a superb work upon *Operative Medicine*, which was translated into English, German, Dutch, Italian, and Spanish, his success as a writer upon surgery has been so far overshadowed by his brilliant achievements in physiology, that this work, upon which another might have built an enduring reputation, is now regarded merely as an episode in his remarkable career. If what is called genius ever belongs to men of science, Claude Bernard was a man of genius. In the chair of medicine in the *College of France*, he was the immediate successor of Magendie, and he occupied a professorship that had been filled by Vidius, Sylvius, Riolan, Corvisart, and Laennec. His successor may bear comparison with any of his predecessors more easily than with Claude Bernard.

A complete account of the labours of Bernard since he first entered the field of what may be termed experimental physiology would be the greatest part of a history of the progress of physiology for the past thirty-five years. The influence of his method is now felt wherever physiology is studied. Investigators in all parts of the civilized world are now treading in the paths opened by Bernard. His younger disciples may live to see the day when all but Frenchmen will forget that Bernard was born in France, and will remember only that his name and fame belong to Physiology.

The first important physiological memoir published by Bernard was entitled *Recherches anatomiques et physiologiques sur la corde du tympan*, 1843. Bellingeri, in 1818, discussed the question as to whether the sense of taste in the tongue was derived from the proper filaments of the fifth nerve, or from the facial by the chorda tympani. In 1821 Roux described loss of taste on one side of the tongue attending paralysis of the facial. In 1831 Montault described the same condition in certain cases of facial palsy. Notwithstanding these observations, however, the general opinion was that the lingual branch of the fifth was a nerve of taste, and this was described in works upon anatomy and physiology as the gustatory branch

of the fifth. Bernard gave a minute description of the course and relations of the chorda tympani in different classes of animals and in man. He showed, by direct experiments upon animals, that destruction of this nerve had no effect upon the general sensibility of the tongue, but that it affected the sense of taste alone. In a second memoir, published in 1845, he confirmed the results of his experiments upon the inferior animals by observations upon the human subject. Bernard established the definite scientific fact that the chorda tympani presides over the sense of taste in the anterior portion of the tongue. As such it remains and is accepted at the present day by nearly all physiologists.

In 1844 Bernard published an article on the gastric juice, in which he recited a number of ingenious experiments with regard to the elimination by the gastric mucous membrane of certain foreign substances introduced into the circulation. He caused an animal to swallow a salt of iron, and then injected a solution of ferrocyanide of potassium into the veins. He noted, after a short interval, the formation of Prussian blue in the stomach, showing that the ferrocyanide had passed into the gastric juice. He made at the same time other experiments, injecting cane-sugar, gelatine, and albumen into the bloodvessels; but these experiments were not so important as those which he made later, in conjunction with Barreswil, upon the nature of the free acid of the gastric juice, showing, in the first place, that a certain degree of acidity of the gastric juice was necessary to its digestive power, the nature of the acid being not absolutely essential. In 1844 he published another memoir, showing the arrest of stomach digestion by section of the pneumogastric nerves. It will be remembered that our accurate knowledge of stomach-digestion dates from the experiments upon Alexis St. Martin, published by an American physician, Dr. Beaumont, in 1833, and that the observations by Bernard were made immediately after the experiments published by Blondlot in 1843, when very little was known of the physiological action of the stomach. Aside from one of the most important discoveries made by Bernard, viz., the action of the pancreatic juice in digestion, he made, very early in his career, important observations upon the mixed digestive fluids found in the small intestine, and he showed their action upon various alimentary substances, including the albuminoids.

In 1848 Bernard made a discovery which attracted more attention than any new development in physiological science since the discovery of the distinct properties of the anterior and posterior roots of the spinal nerves. In that year he published, in the *Archives générales de médecine*, a memoir entitled *De l'origine du sucre dans l'économie animale*. This publication, which afterward appeared *in extenso* in the *Comptes Rendus de l'Académie des Sciences* in 1850, and which received the prize of experimental physiology in 1857, made a most extended and profound impression. The observations therein detailed were soon repeated in France, Germany, England, and America, and Bernard became recognized at once as one of the greatest of living physiologists.

It is difficult to imagine a discovery so extended in its applications, and so complex as this has proved to be in its relations, which could have been more thoroughly elaborated by its author. In the first place, the method of its development is a perfect illustration of the system of investigation which dates in physiology from the discovery of the circulation of the blood by Harvey, and which is so strongly set forth as the only reliable system of scientific research by Bacon. Followed, as it was, by numerous other

important discoveries by Bernard, it is not to be wondered at that enthusiastic workers sprang into existence wherever physiology was studied, followers of what began to be known as the French school. It will not be difficult for many who read this notice to remember the deep impression made upon medical men not specially interested in pure physiology by the researches of Bernard. He was visited by nearly all physicians who went from this country to Europe to study disease in the hospitals. We now have in our mind the remembrance of accounts given us by old practitioners of medicine, of the wonderful dexterity in experimentation, the unvarying affability, and the patient and kind attention always given to strangers by the great French physiologist. In ingenuity in devising new methods of verifying and enforcing his doctrines, and in skill in their execution, no one has ever equalled Claude Bernard. A practical physiologist, whose studies began at the time when he was at the zenith of his renown, could hardly write a notice of his works that would appear to be less than a eulogy. He passed away as he lived; and he corrected the proofs of an unfinished publication upon his death bed.

The story of the discovery of the glycogenic function of the liver is a most interesting illustration of the method of study which Bernard followed out with such remarkable success. In 1848, having reflected that sugar was sometimes discharged in the urine in disease, he conceived the idea that there must be some organ in the body designed to consume and destroy it as sugar, in health. His first experiments were undertaken with the view of discovering this organ and its functions. With this object in his mind, he fed a dog with a mixture containing large quantities of starch and sugar, and attempted to follow the sugar as it passed in the blood through the various organs. He analyzed the blood of the portal vein, and found sugar. He then examined the substance of the liver and the blood of the hepatic veins, still finding sugar. As a counter-experiment, he examined the blood and the substance of the liver in a dog that had been fed exclusively upon meat. He found no sugar in the portal vein, but it existed in abundance in the liver and in the blood of the hepatic veins. This was the discovery of animal glycogenesis. Unlike most great discoveries, no one had prepared the way, and the discovery was made unexpectedly at the very threshold of the experimental investigation.

The perfection of detail to which the discovery of animal glycogenesis was brought by its author is almost without a parallel in the history of physiology. Harvey left to Malpighi the task of discovering the system of vessels connecting the arteries with the veins; but Bernard left scarcely anything for his contemporaries or his successors but to verify his results. In his memoir published in 1850, he showed that glycogenesis exists in man, in the quadrumana, the carnivora, rodentia, ruminantia, and the pachydermata, as well as in birds, fishes, reptiles, mollusks, and articulates. He has since answered, and, indeed, he answered to a great extent in advance, all the objections that could be raised against his conclusions. In successive publications, he showed the mechanism of the production of sugar by the liver, an amyloid substance, which he called glycogenic matter, being formed first, this substance being gradually converted into sugar, and as sugar being taken up by the blood of the hepatic veins. The experiment by which this was demonstrated was the following: A liver taken from an animal just killed was washed free from sugar by a stream of water passing through the bloodvessels. From such a liver the glycogenic matter may be extracted, or, if the liver be kept in a warm place for a number of hours, sugar will make

its appearance in its substance by the change of a portion of its glycogenic matter. In the course of his investigations upon this subject, he showed the influence of digestion, inanition, and various other conditions upon glycogenesis. He divided the pneumogastric nerves, and arrested the production of sugar; he stimulated the same nerves, and exaggerated its production so as to render an animal diabetic. He irritated the floor of the fourth ventricle, and produced artificial diabetes (1849). He showed the reflex action of irritation of the filaments of the pneumogastrics distributed to the lungs. He discovered the glycogenic function of the placenta, which exists before this function is performed by the liver, in the fœtus. Not to follow out his observations in their order and in full detail, his experiments were so varied and numerous, and he completed the discovery so thoroughly, that the name of Claude Bernard is the only one that has any real connection with the function of glycogenesis in animals.

The next important discovery made by Bernard was in 1848, following closely upon the publication of his researches upon the glycogenic function of the liver. At that time our knowledge with regard to the function of digestion was very limited and indefinite. Writers described a process called chymification, as occurring in the stomach, the food being reduced in this organ to a pultaceous mass, and chyification in the small intestine, where the food became liquefied and was taken up in the form of chyle. Although allusions had been made to the function of the pancreas in the digestion of fats, by De Graaf, in 1671, and by Eberle, in 1838, nothing definite was known of the action of the normal pancreatic juice before the announcement of the discovery of its true function by Bernard to the Society of Biology of Paris, in 1848, the experiments dating from 1846.¹ In completeness of detail and in perfection of logical deduction from full and definite experimental results, the history of the function of the pancreas as given by Bernard is fully equal to his description of animal glycogenesis. Before the publication of his memoir, the pancreas had been called the abdominal salivary gland, and it was supposed by some to moderate the acidity of the bile, an idea so indefinite that it hardly merits the name of an hypothesis.

Bernard was the first physiologist who obtained pure, normal pancreatic juice from a fistula in a living animal. He demonstrated its reaction, its general properties, and its action in digestion, not only upon fats but upon other alimentary matters. In his first publication he answered various objections which were subsequently made, showing that the fluid discharged from a permanent fistula, or from a fistula of several days' standing, was abnormal. He showed that the normal pancreatic juice was the only one of the digestive fluids that would instantly form a complete and permanent emulsion with fats. This fact he demonstrated in various classes of animals. He also showed that fatty matters passed through the intestinal canal undigested in cases of serious organic disease of the pancreas. Fatty diarrhœa coexistent with organic disease of the pancreas had been observed by Dr. Richard Bright in 1832, but this did not serve to direct the attention of physiologists to the action of the pancreatic juice in digestion. Bernard noted the fact that, in the rabbit, the opening of the pancreatic duct is several inches below the orifice of the bile-duct. He showed by experi-

¹ We have mentioned the glycogenic function of the liver first, as it was the publication of this discovery which seems to have produced the more decided impression. The discovery of the action of the pancreas in the digestion of fats was published at about the same time.

ment that lacteals filled with white chyle first appeared in this animal below the opening of the pancreatic duct.

In 1859 Bernard published a second series of experiments, in which he showed the effects of destruction of the pancreas in living animals. Animals in which the pancreas had been destroyed by the injection of melted tallow into the ducts died of inanition, although the appetite was voracious and large quantities of food were taken, showing that the function of the pancreas was essential to life. In these animals fatty matters passed through the intestinal canal undigested, and the digestion of meats, also, was incomplete. In addition to the function of the pancreatic juice in the digestion of fats, Bernard demonstrated its action upon albuminoid articles of food and upon cane-sugar, showing that it is probably the most important of the digestive fluids, and the one possessing the most varied properties and functions. His description of the functions of the pancreas left little to be learned. It was, like most of his systematic series of investigations, complete in itself.

Another very important discovery made by Bernard early in his career as a physiologist was that of the functions of the spinal accessory nerve in connection with phonation. This was published first in 1844, thus antedating the publication of his observations upon glycogenesis and upon the functions of the pancreas, both of which appeared in 1848. As we progress in our account of the physiological labors of Bernard, we find it difficult to carry out an analysis, even of his most important works alone, in a strictly chronological order. He made important researches in connection with nearly every subdivision of the subject of physiology, and, particularly in the earlier part of his career, his experimental labours were enormous and exceedingly varied. Most of those who are at all familiar with physiological literature at once connect the name of Bernard with the discovery of the sugar-producing function of the liver, and it is only natural to give prominence, early in this notice, to his experiments upon this subject; but a more connected history of his other contributions to physiological knowledge can be given, if we classify his researches, as far as possible, according to the systems to which they relate.

Bernard's contributions to our knowledge of the functions of the digestive system were many and varied. We have already alluded to his experiments upon the gastric juice and stomach-digestion. He was one of the first to recognize the importance of studying the combined as well as the successive action of the different digestive fluids, introducing a truly philosophic method into the study of their functions. Among the earliest of his works is a series of observations upon the properties and functions of the saliva.

In 1831 Leuchs discovered the action of the mixed saliva in changing starch into sugar. In 1845 a commission, consisting of Magendie, Rayer, Payen, and others, made an interesting report to the Academy of Sciences of Paris upon the mixed saliva of the horse; but they obtained the fluid by causing a horse to eat bran that had been carefully washed, taking the mass, as it was swallowed, from an opening in the œsophagus, and separating the saliva. In 1847 Bernard, taking up the question where it had been left by the commission, carefully studied the properties of the pure secretions taken from the ducts of each of the three salivary glands, the properties of these three fluids mixed, and the properties of the mixed saliva and the mucus of the mouth and pharynx. Physiologists now have a very distinct idea of the time of secretion and the properties of each

of the three varieties of saliva, and their connection with mastication, gustation, deglutition, the digestion of starch, and the process of stomach-digestion. It is not too much to say that these definite notions depend mainly upon the experiments made by Bernard since 1847.

In 1850 Bernard made a series of interesting experiments upon the influence of the pneumogastric nerves upon the œsophagus. He showed that deglutition was impossible immediately after section of these nerves in the neck, that the food which passed below the pharynx remained in the œsophagus and did not reach the stomach, and that the so-called vomiting, which sometimes occurs, is due to contraction of the muscular structure of the œsophagus, when its fibres are directly excited to action by distension of the tube.

In the summer of 1855 the lectures delivered by Bernard at the College of France were devoted to the subject of digestion. They were published in 1856, under the following title: *Leçons de physiologie expérimentale appliquée à la médecine; tome deuxième. Cours du semestre d'été 1855*. These lectures contained a full and extended account of all of his discoveries which relate to digestion, as well as historical *résumés*. He gave, also, a most intelligent and appreciative summary of the observations of Dr. Beaumont upon Alexis St. Martin. Later researches have corrected but few errors in these lectures delivered by Bernard in 1855. His first published lectures, delivered in the winter of 1854-55, were devoted to glyco-genesis. The lectures upon digestion were the first which embraced a large subject, in which a consideration of the labours of others was necessarily involved. In fecundity of device for illustration, and in directness and felicity of diction, there was nothing at that time superior to them in any language. These lectures, which were read extensively in this country, had an influence beyond the mere dissemination of the discoveries made by their author. A teacher of physiology, reading these lectures, could see at once, not only a definite and striking account in words of the actual state of knowledge of the function of digestion, but he could picture to himself the vivid manner in which the subject-matter must have been enforced upon pupils by the brilliant experiments upon living animals with which they were illustrated.

In addition to the discoveries already mentioned, a very important and suggestive communication was made by Bernard to the French Academy of Sciences, in March, 1846. In this, Bernard presented the results of a series of experiments upon herbivorous and carnivorous animals subjected to an identical diet, and a comparison of the urine of the same animals deprived of food. He found that fatty matters appeared in the chyle of rabbits very low down in the intestine, and he states that this observation led him to the discovery of the organ which digested fats. With regard to the effects of deprivation of food upon herbivora, he showed that these animals, without food, became true carnivora, inasmuch as they then consumed the elements of the blood. Under these conditions the urine of the herbivora, which is normally alkaline, turbid, and rich in carbonates, became clear, acid, and rich in phosphates and urea.

In 1850 Bernard presented another important memoir to the Academy of Sciences. By a series of most ingenious experiments, he showed that cane-sugar and the albumen of white of egg must pass through the liver before complete assimilation by the blood. When these substances were injected into the jugular vein, they did not become assimilated, but were discharged in the urine. No such discharge took place, however, when

they were injected into the portal vein. He showed, also, that it was not necessary for fats to pass through the liver, and that they were absorbed by the lacteals and became directly assimilated by the blood. As the result of these experiments, he concluded that the chyle is not to be considered as a liquid containing all of the nutritive principles resulting from digestion, as had been the almost universally adopted opinion.

The two volumes of lectures published by Bernard in 1859, entitled *Leçons sur les propriétés physiologiques et les altérations pathologiques des liquides de l'organisme*, appeared just after his lectures upon the nervous system, which latter will be referred to in another connection. These lectures were even more exhaustive and elaborate than those upon digestion. The first volume was devoted to a consideration of the blood. In 1853 he had published a memoir on the capacity of the blood of different parts for absorbing oxygen, containing a number of striking experiments. In the volume of lectures referred to, he recited a large number of exact observations upon the temperature of the blood of different parts, settling many important questions that had before been undetermined. His general conclusions from these experiments was that the seat of calorification of the blood was in all the tissues of the organism, a deduction which has been fully confirmed by subsequent observations. He then investigated the differences in the blood-pressure in different vessels, and the modifications in the pressure under various physiological conditions, the influence of the nervous system, etc. An important series of investigations made in this connection was with regard to the influence of the nervous system upon the colour of the blood, particularly the blood coming from the glands during their functional activity and during repose. His observations upon the colour of the blood coming from the salivary glands, and his description of the nervous influence over the activity of glands, were most striking, and attracted a great deal of attention. For example, he excited secretion in the submaxillary gland by stimulating what he called its motor nerve, and the venous blood from the gland became red. By stimulating another nerve he arrested the secretion, and the blood from the gland became dark.

The most important experiments, however, made upon the blood were those in which he determined the proportions of oxygen by the method of displacement with carbonic oxide. The older observations of Magnus and others had been very contradictory and obscure in their results. Bernard showed that all the methods of analysis of the blood for gases which involved a delay of several hours before the results could be ascertained were faulty, for the reason that oxygen was consumed and carbonic acid produced in the blood after it had been drawn from the body. He ascertained that, by agitating the blood with carbonic oxide, this post-mortem consumption of the oxygen is arrested; and he obtained, by using carbonic oxide to displace the oxygen, the actual quantity of this gas contained in the blood at the time that the analysis was begun. These were the first experiments which gave an accurate estimate of the actual proportion of the gases existing in the blood under different physiological conditions. They also showed the mechanism of poisoning by carbonic oxide, and illustrated the function of the blood-corpuscles as oxygen-carriers. The importance of these facts is sufficiently evident.

In the second volume of lectures upon the liquids of the organism, Bernard very clearly and distinctly defined the differences between secretions and excretions, general distinctions which have hardly met with the atten-

tion at the hands of writers upon physiology that their importance and accuracy merited. I pass over the reiteration of his views upon the properties and functions of the digestive fluids, which were enforced by additional experiments, and come to his researches upon the mechanism of secretion and excretion.

In 1821 Prévost and Dumas, who demonstrated the accumulation of urea in the blood following extirpation of the kidneys, gave to practical physicians the first definite and positive basis for a rational pathology of renal diseases. These experiments were confirmed and somewhat extended by other observers before the time of Bernard. The important fact developed by the researches of Prévost and Dumas was a great discovery; but Bernard, bringing to a study of the question his matchless ingenuity and dexterity in experimentation, filled many of the gaps left in the original investigations. He showed the vicarious elimination, for a time, of urea by the stomach and intestines, during which time there is no accumulation of urea in the blood, following extirpation of the kidneys; and he demonstrated that, after the vicarious elimination of urea has ceased, this principle produces blood-poisoning. His experiments answer most completely the objections which were subsequently made to the idea that urea is formed in the system and eliminated by the kidneys, and is not formed in the kidneys, by Oppler, Perls, Zalesky, and others. In short, Bernard settled beyond a reasonable doubt the doctrine that all the excrementitious principles are formed in the system at large by the process of disassimilation, and are eliminated by proper organs.

We do not remember that any physiologist, before Bernard, enunciated definitely and positively the great distinctions between secretions and excretions, which he states in substance as follows: First, that the production of secretions is generally intermittent, while the production of excretions is generally constant; second, that the elements of the true secretions do not pre-exist in the blood, but are formed *de novo* in the glands themselves, while the elements of excretion pre-exist in the blood, and are not formed in excreting organs; third, that removal of secreting glands does not cause an accumulation of the elements of secretion in the blood, while removal of excreting organs is followed by accumulation of excrementitious matters in the blood after their removal by vicarious action is arrested; and, finally, that secretions have important functions to perform in the economy, while excretions have no function to perform and are simply separated from the blood to be discharged from the body.

In the same volume Bernard took up again the question of the influence of special nerves over the salivary secretions. He extended his observations by a variety of most delicate and ingenious experiments, showing the influence of certain nerves, not only over secretion but upon the blood-pressure, the colour of the venous blood coming from the glands, and the proportion of oxygen in the venous blood during glandular repose and activity. He demonstrated the general law that, during the so-called repose of true secreting organs, the cells of the glands are forming the characteristic elements of the secretions; that when the secretion is discharged, the supply of blood sent to the glands is largely increased, and the elements of the secretions are washed out, so to speak, by a watery transudation and are discharged by the ducts. This law gave physiologists an idea of the reason why the flow of true secretions cannot be constant, a certain period of so-called repose being necessary for the formation of the proper elements of secretion. It explained the fact that the fluid discharged without inter-

mission from a permanent pancreatic fistula is not normal and does not possess the digestive properties of the true pancreatic juice, for the reason that no interval exists for the formation of pancreatine by the cells of the gland. This completely answers the objections made by certain physiologists to the conclusions drawn from Bernard's original observations upon the pancreas.

In 1857 Bernard published a course of lectures entitled *Leçons sur les effets des substances toxiques et médicamenteuses*. These lectures were delivered at the College of France in 1856, just after the death of Magendie, his illustrious predecessor in the chair of medicine. The first lecture of this course was an admirable review of the life and labours of Magendie. Bernard had been his prosector and assistant for many years; he had supplied his place in the lecture-room; but Magendie, the greatest physiologist of his day, the discoverer of the properties of the roots of the spinal nerves, has the honour, almost as great as any achieved by his own labours, of having been the master of Claude Bernard. Bernard's eulogy of Magendie was a modest and touching tribute of one great man to another who had been his guide and model.

In his lectures upon toxic and medicinal substances, Bernard developed many new ideas with regard to the action of deleterious and irrespirable gases, and showed the true mechanism of death from inhalation of carbonic acid. He also made a number of interesting experiments, entirely novel in their character, upon the tolerance of a vitiated atmosphere by animals slowly and gradually subjected to its action. In these experiments, he studied the action of carbonic oxide in fixing itself in the blood-corpuscles, and rendering them incapable of absorbing oxygen and carrying it to the tissues. But one of the most important of his series of observations related to the effects of the woorara poison—called by the French *curare*. He was one of the first, if not the first, to thoroughly investigate this remarkable agent, which is now so largely used in physiological investigation, showing its peculiar effects upon the motor system of nerves. It was by experiments with woorara that Bernard was able to settle definitively the fact of the mutual independence of muscular and nervous irritability.

Many of the most important discoveries made by Bernard relate to the physiology of the nervous system. We have already alluded to his researches on the functions of the chorda tympani nerve, published in 1843, from which his brilliant career as a physiologist may be dated. We remember well a conversation with Bernard in 1861, in which he referred to this memoir. His young friends, *internes* in the Paris hospitals, finding him at work, asked what he was doing. When told that he was writing a memoir on the chorda tympani, they showed some surprise and amusement that he should write a lengthy paper on such a little nerve. Bernard related with much humour this little incident, and his memoir showed that the small nerve was not without great physiological interest and importance. Bernard did few small things. He was one of the rare investigators of our time who had little to do with trivialities. In a social and amiable way, he often referred to a class of physiologists who contribute to literature a mass of little things, unimportant in themselves and in their relations, and simply showing work. "Some men," he said, "will publish minute details of a hundred experiments, ninety-nine of which are failures, and they seem to think that it is sufficient to do work, although they may really accomplish little or nothing." We know of no experiments published by Bernard that are not intelligent, useful, and

important. He was not fond of complicated and intricate apparatus; and he made his investigations in the simplest way, so that most of his experiments could be easily repeated by a practical observer. His results are an illustration of the fact that an imposing laboratory and complex machinery for investigation do not of necessity make the greatest physiologists or lead to the most important discoveries.

One of the most remarkable errors made by Bernard in his earlier writings upon the nervous system was that he ascribed the discovery of the distinct properties of the roots of the spinal nerves to Sir Charles Bell, and characterized the observations of Magendie as simply confirmatory. His two volumes of *Lectures on the Nervous System*, published in 1858, embody his views and discoveries up to the date of publication. In the first volume he says: "Charles Bell had indicated by induction, about the beginning of this century, that the posterior roots should be sensitive and the anterior roots motor. We know that later Magendie found, by dividing separately one and the other, that, upon this point, the views of Charles Bell were exact." It was not until 1867, ten years later, in his report on the progress of physiology in France, that he rendered full justice to Magendie, who was the real discoverer of the properties of the roots of the spinal nerves in 1822. In this report Bernard says: "In 1811, then, Charles Bell did not know the functions of the roots of the spinal nerves; he falsely interpreted a fact which it has been desired later to allege in his favour."

It is certain that Bernard did not intend or desire to deprive Magendie of the credit of any discovery; and it must be remembered that Sir Charles Bell's pamphlet, entitled *An Idea of a New Anatomy of the Brain*, was not accessible, and was known only through extracts and an obscure republication which appeared anonymously in 1839. During a certain period of his physiological career, Bernard was more occupied in making than in studying physiological literature, and he had little or no knowledge of the English language. Nearly all of his works, particularly those of early date, were full of original research and contained little in the way of historical discussion. His later writings, however, showed more of a tendency to generalization; but he still dealt largely with facts that he had developed by his own researches.

Those who are interested in the history of what is termed nerve-physiology, which is so much studied at the present day, will find, in the first volume of Bernard's lectures on the nervous system, published in 1858, most elaborate and interesting researches on the phenomena developed by the application of galvanic currents to the nerves. In this volume he also made some important additions to our knowledge of reflex action.

The second volume of the lectures on the nervous system, published in 1858, embodies nearly all of Bernard's discoveries with regard to the functions of special nerves. The same ingenuity in devising experiments to settle disputed questions and develop new facts is observed in this as in his other writings. He devised a method of cutting the facial in the case of the tympanum, and noted the effects upon animals of intracranial and extracranial section of this nerve. He took up Magendie's operation of intracranial division of the large root of the fifth nerve, and studied most accurately the effects of its section before and after it had received its communicating filaments from the sympathetic. He made a number of most interesting experiments, also, upon the motor nerves of the eye, and showed the influence of the third nerve upon the movements of the iris.

We have already briefly referred to the memoir upon the functions of the spinal accessory nerve, originally published in 1844. In 1832 Bischoff published a series of experiments upon goats, in one of which, having divided all the roots of the spinal accessory on both sides, with extensive exposure of the parts which greatly exhausted the animal, he found that the sound emitted by the larynx "was one which could in no wise be called voice." This experiment, however, was very unsatisfactory, and attracted but little attention. Before the publication of Bernard's memoir, it was generally held by physiologists that the recurrent laryngeal branches of the pneumogastrics were the nerves of phonation.

One of the greatest merits of Bernard's observations upon the spinal accessory was the method which he employed for extirpation of the nerve. The difficulty had been, in the experiments of Bischoff, to divide all of the roots without such a shock to the animal and excessive loss of blood as to render very unsatisfactory any observations after the section had been made. It will be remembered that the extensive origin of the nerves from the medulla oblongata and the cervical portion of the spinal cord had apparently rendered it necessary to open a large portion of the spinal canal. Bernard attempted to do this after Bischoff's method, but without satisfactory results. He then devised the method of removing the nerve by avulsion. He cut down upon the muscular branch as it passes through the sterno-cleido-mastoid muscle, followed up the nerve by careful dissection as far as the posterior foramen lacerum, seized the trunk as it emerges from the foramen with broad-billed forceps, including the communicating branch to the pneumogastric, and then, by gentle, firm, and steady traction, he pulled out the entire nerve by the roots. These experiments he performed upon young cats, dogs, and guinea-pigs. When both nerves were completely extirpated in this way, the voice was abolished, while the respiratory movements of the larynx were not affected. Extirpation of one nerve rendered the voice hoarse. Extending his experiments still further, he showed that the filaments which preside over the vocal movements of the larynx come from the roots originating at the medulla oblongata, and that the roots from the spinal cord send their filaments to the muscular branch. By these most simple and satisfactory experiments, it was definitely ascertained that the innervation of the larynx is double; that the nerve which animates the muscles concerned in modifying the tension of the vocal cords is the spinal accessory, the filaments of which go to the pneumogastric by the communicating branch and pass to the larynx through the recurrent laryngeals; and that the filaments of the recurrent laryngeals which preside over the ordinary respiratory movements of the larynx are derived from other motor communications of the pneumogastric, and not from the spinal accessory.

In the same volume of lectures, Bernard recites a number of interesting and original experiments upon the pneumogastric nerves and their various branches.

We now come to a discovery with regard to the nervous system which has, perhaps, been more extended by subsequent observations than any other that we have mentioned. We refer to Bernard's observations upon the nerves of the so-called sympathetic system.

In 1816 Dupuy removed the superior cervical sympathetic ganglion in horses, and noted vascular injection of the conjunctiva, increase of temperature in the ear, and an abundant secretion of sweat upon the side of the head and neck corresponding to the section. In the *Comptes Rendus de la*

Société de Biologie, Paris, 1851, tome iii, page 163, Bernard reported a series of experiments upon rabbits, in which he divided the sympathetic in the neck upon one side, and noted, on the corresponding side of the head and the ear, increased vascularity, and an elevation in temperature, amounting to from 7° to 11° Fahr. This condition of increased heat and vascularity was sometimes observed for several months after division of the nerve. Brown-Séquard repeated and extended these observations very soon after; but we cannot find that his experiments were published before they appeared in *The Medical Examiner*, Philadelphia, August, 1852. The experiments of Dupuy attracted very little attention. Valentin made a reference to filaments of the sympathetic distributed to the blood-vessels and influencing their calibre, in 1839. We regard Bernard as the discoverer of the vaso-motor system of nerves; and it is certain that the publication of his experiments antedated the appearance of Brown-Séquard's observations by about one year. We hardly need discuss the great importance of this discovery, showing, as it does, the influence of the sympathetic upon the supply of blood to parts, calorification, and nutrition, nor shall we refer in detail to the facts that have been developed by others as a consequence of the experiments of Bernard. The observations published in 1851 were the real starting-point of our present knowledge of the functions of the sympathetic system.

The two volumes of lectures on the *Liquids of the Organism* were published in 1859. From that time until 1865, when a volume of lectures appeared, entitled *Introduction à l'étude de la médecine expérimentale*, the literary labours of Bernard were confined mainly to articles in the *Journal de la physiologie*, the publication of which began in 1858. To this Journal, which was continued as the *Journal de l'anatomie et de la physiologie* after 1864, Bernard contributed numerous original papers. In 1863 there appeared the first number of the *Revue des cours scientifiques*, which was continued after 1871 as the *Revue scientifique*. The editors of the *Revue* published the lectures of Bernard as they were delivered, and the last appeared after his death. The most important of these lectures were afterward collected and published as separate volumes. The *Introduction à l'étude de la médecine expérimentale*, published in 1865, was followed, in 1866, by the *Leçons sur les propriétés des tissus vivants*; this, by the *Leçons de pathologie expérimentale*, published in 1872; this, by the *Leçons sur les anesthésiques et sur l'asphyxie*, published in 1875; this, by the *Leçons sur la chaleur animale*, published in 1876; this, by the *Leçons sur la diabète et la glycogénèse animale*, published in 1877; and finally, just after the death of the author (1878), two volumes have appeared, one entitled *La science expérimentale*, and the other, *Leçons sur les phénomènes de la vie*.

A full analysis of the original contributions of Bernard to physiological literature would extend itself nearly to the dimensions and scope of a systematic treatise. There are few subjects connected with physiology that do not bear the impress of his labours. His memoirs and lectures up to 1859 were mainly original, and they contained little in the way of generalities, although he prefaced nearly all of his volumes with an exposition of the experimental method. After 1865 the character of his thoughts and studies seems to have changed. While he constantly reiterated his original views and extended his observations in the directions opened by his own discoveries, he devoted more attention to generalization and to the results of the labours of others. His method, which was rigidly experi-

mental and deductive, he constantly advocated, and the labours of his pupils in France and elsewhere have borne testimony to the good effects of his precepts and example. It may not be out of place to refer here to the influence which his works have exerted upon physiology in this country. In 1851 Prof. Dalton gave a short course of lectures upon experimental physiology to the students of the Boylston Medical School in Boston. The same year (1851-1852) he gave a course at the Buffalo Medical College, illustrated by experiments upon living animals; and in 1852 he attended Bernard's lectures at the College of France. Since 1855 he has lectured upon physiology in the same way in New York, and others have followed his example. We venture to say that demonstrative teaching in physiology in this country is to be attributed to the influence of Bernard's works, to say nothing of the original investigations which have given our own observers a more than respectable position in physiological literature. The only publication, however, which has appeared here, to which Bernard's name is attached, is a little book of *Notes of M. Bernard's Lectures on the Blood*, by Walter F. Atlee, M.D., published in Philadelphia, in 1854.

The smallest of Bernard's titles to fame were the titular and other honours that were bestowed upon him in the course of his remarkable career. About 1841, before he received the degree of Doctor of Medicine, he was attached to the laboratory of Magendie as assistant and prosector. In 1843 he took his degree in Medicine. In 1853 he was admitted a Doctor of Sciences; and the chair of general physiology was created for him in the Faculty of Sciences at the Sorbonne. From 1847 to 1855 he acted as *professeur suppléant* to Magendie at the College of France, and in 1855 he succeeded Magendie as Professor of Medicine. In 1868 he was appointed Professor at the Museum of Natural History. He was elected a member of the Academy of Medicine in 1861, perpetual president of the Society of Biology in 1867, and a member of the Institute of France in 1869. In 1867 he was appointed commander in the Legion of Honour, and in 1869 Senator of France. At the time of his death he was a member of most of the learned societies of Europe.

It has been a peculiarly agreeable task for us to attempt to follow the scientific career of the great physiologist whose labours are now ended; and we have often found it difficult to restrain our enthusiasm within the limits that we had fixed, for we intended to write a simple analytical review of his most important works. We shall not compare him with his contemporaries or with the other great discoverers whose names we revere and honour. He was a simple searcher after truth; and his thirty-five years of labour in physiology have brought forth more fruit and have done more for humanity than any one now living can hope to accomplish. His disciples may feel proud that they are permitted to continue their work as followers of Claude Bernard.

Many of the writings of Bernard are published as separate memoirs, which are difficult of access, and as contributions to periodicals; but all of his discoveries and his most important reflections upon physiological subjects will be found in the following works, which are enumerated in the order of their publication:—

Leçons de physiologie expérimentale, 1855.

Leçons de physiologie expérimentale, tome deuxième, 1856.

Leçons sur les effets des substances toxiques et médicamenteuses, 1857.

Leçons sur la physiologie et la pathologie du système nerveux, 2 vols., 1858.

Leçons sur les propriétés physiologiques et les altérations pathologiques des liquides de l'organisme, 2 vols., 1859.

Introduction à l'étude de la médecine expérimentale, 1865.
Leçons sur les propriétés des tissus vivants, 1866.
Leçons de pathologie expérimentale, 1872.
Leçons sur les anesthésiques et sur l'asphyxie, 1875.
Leçons sur la chaleur animale et sur les effets de la chaleur, 1876.
Leçons sur le diabète et la glycogénèse animale, 1877.
Leçons sur les phénomènes de la vie, 1878.
La science expérimentale, 1878.

The volume entitled *La science expérimentale* is a collection of memoirs and addresses upon different subjects connected with physiology, from 1844 to 1876. The subjects are as follows: Progrès des sciences physiologiques; Problèmes de la physiologie générale; La vie, les théories anciennes et la science moderne; La chaleur animale; La sensibilité; Le curare; Le cœur; Le cerveau; Discours de réception à l'Académie française.

A. F., JR.

ART. XVIII.—*Higher Medical Education.*

1. *Practical Essays on Medical Education and the Medical Profession in the United States.* By DANIEL DRAKE, M.D., Cincinnati, 1832. 8vo.
2. *Lectures on Medical Education.* By SAMUEL CHEW, M.D., Philadelphia, 1864. 8vo.
3. *Contributions to the History of Medical Education and Medical Institutions in the United States of America, 1776–1876.* By N. S. DAVIS, A.M., M.D., Washington, 1877. 8vo.
4. *Higher Medical Education, the True Interest of the Public and the Profession. An Address Introductory to the 112th Course of Lectures in the Medical Department of the University of Pennsylvania.* By WILLIAM PEPPER, A.M., M.D. Philadelphia: J. B. Lippincott & Co., 1877. 8vo.
5. *De l'organisation des Facultés de Médecine en Allemagne.* Par le docteur JACCOUD, Paris, 1864. 8vo.
6. *Les hautes études pratiquées dans les Universités Allemandes.* Par ADOLPHE WURTZ, Paris, 1870. 4to.
7. *Etude sur l'organisation de la Médecine en France et à l'étranger.* Par LEON LE FORT, Paris, 1874. 8vo.
8. *Ueber das Lehren und Lernen die Medicinischen Wissenschaften an den Universitäten der Deutschen Nation.* Von Dr. TH. BILLROTH, Wien, 1876. 8vo.
9. *L'enseignement de la Médecine en Allemagne.* Par LOUIS FIAUX, Paris, 1877. 8vo.
10. *De la situation de l'enseignement Médical en France.* Par CHAUFFARD, Rev. des Deux Mondes, Jan. 1, 1878.
11. *Medical Politics; being the Essay to which was awarded the first Carmichael Prize, 1873.* By ISAAC ASHE, M.D. (etc.), Dublin, 1875. 8vo.
12. *Report of Proceedings of the Meeting of the General Medical Council in 1877.* Med. Times and Gaz., May and June, 1877.

It has been observed that the difficulty in forming an opinion on a subject is materially increased by studying it, and, as regards medical education, this statement is certainly correct. We have had occasion to examine with care the publications whose titles head this article, and have

also, with somewhat less care, glanced over about a hundred other essays and addresses on the same subject, and the result is that we have no plan at present which can be recommended as a certain cure for the evils complained of. Having made this confession of ignorance, we now propose to set forth some of the plans of others who have been more fortunate.

No critical review of the works mentioned will be attempted; those who are interested in the subject are advised to read all of them; we shall give but a brief *résumé*, with an occasional comment or query.

There may have been a time when the physicians of some favoured country were entirely satisfied with each other's professional skill; but the records of that period have been lost. Hippocrates, Galen, Van Helmont, and Sydenham speak of contemporaneous physicians in much the same tone as that in which English, French, German, and American writers have been for fifty years, and are to-day, commenting on the results of their systems of medical education.

So long as this complaining does not pass the limits of what may be called grumbling, proceeding mainly from those who are out of the race, or who may be reasonably suspected of being misled by the idea that their own powers and qualifications have been overlooked, it may be allowed to pass without much notice: but when it becomes general; when in one particular country we hear it from students, teachers, and from private physicians generally; and when we find that the grumblers of other nations, always ready to disparage what they themselves possess, and to draw unfavourable contrasts between their systems and those of other countries, make an exception with regard to that particular country, we may infer that there is really something wrong in that case. Now this seems to be the condition of things with regard to medical education in the United States at the present time. Every one here seems dissatisfied; and abroad, while English writers are pointing out the superiority of the French or German systems, and French writers demanding less centralization on the English plan, we nowhere find the system of the United States held up as a model.

This may be considered as being, upon the whole, a good sign, since the first step towards improvement is the recognition of the evil to be done away with; but in the United States familiarity seems to have bred contempt in several senses. Of the causes for this state of things we need mention but a few.

The first is the character of medical students, and the motives which induce many to enter the profession. As Dr. Drake puts it:—

“A neighbouring physician wants a student to reside in his office, or one son of the family is thought too weakly to labour on the farm or in the workshop; he is indolent and averse to bodily exertion, or addicted to study, but too stupid for the bar, or too immoral for the pulpit; the parents wish to have one gentleman in the family, and a doctor is a gentleman; these and many other extraneous considerations not unfrequently decide the choice and swell the numbers, while they impair the character of the profession.”

The principal motive for the study of medicine is not the love of science or of humanity; but, as Dr. Pepper points out, “a desire to earn an honest livelihood.” It is a matter of business, and it is natural that the young, inexperienced, and usually poor aspirant should think that the less capital required to obtain the absolutely necessary stock in trade, the better for his purpose. Hence the tendency is towards the minimum qualification—the current sets in the direction of the easiest outlet.

The second cause is, that a thorough education is not as essential to success in the medical as in other professions, nor does its possession insure success in the same ratio. Physicians are not selected by the public with reference to their education; in fact, the public are not competent to judge, and the fashionable doctor is by no means always superior in knowledge. Medical students soon learn this, and are apt to conclude that thorough knowledge is not as desirable in a business point of view as it really is.

A third cause of trouble is, that too much is demanded of the average student, and he is forced to be superficial in his acquirements in self-defence.

The average student wishes to be a practitioner of medicine, to know a pneumonia, or a typhoid fever, or a dislocated shoulder when he sees it, and to know how physicians usually treat such cases. He does not intend to go into the wilderness, but to be near other physicians upon whom he can call in a doubtful case; he has no desire to be a medical expert or a sanitarian, or a specialist of any kind, nor yet to make discoveries or contribute to medical literature. He knows what he most needs for his purposes, *i. e.*, clinical and therapeutical instruction; he wants to see cases, and, as far as possible, the kind of cases he expects to treat. The anatomy which interests him is that of the arteries; for more than the broad general principles of physiology he cares little; he likes his therapeutics neatly packed in formulæ, and as for the languages and natural sciences, he sees very little use in their study. To such a man the majority of the demands for a higher and better medical education seem unreasonable; he does not aspire to a position which requires such an expenditure of time and money to fit one to fill it.

The majority of authors and essayists consider medical education solely as designed to fit men to exercise the art or handicraft of medicine, and therefore consider that as the best system which produces the best practitioners. Now it needs but little reflection to see that all medical practitioners cannot be alike skilful and accomplished. The doctor and the *officier de santé* of France represent two great classes of medical men; classes which must always exist, whether they be distinguished by title or not.

Professional skill, like all skilled labour, has a market value, and will be found where that value is given for it. Nor is the remuneration entirely a matter of money. The thoroughly educated physician requires an atmosphere of appreciation and encouragement, congenial society, and many other things which he will not find in thinly settled and comparatively poor districts.

These districts must, however, have physicians, and these physicians must be mainly routine-practitioners. In the education of such men the most important thing is the study of the disease on the living subject. They are almost all poor men, poor in time as well as money; they cannot have that sort of preliminary education contemplated by the requirement of the Baccalaureate Degree. This must be taken into consideration in planning their curriculum. They will never learn chemistry, geology, physiology, and pathology, but they may learn how to treat fever, fractures, and wounds, how to tie an artery, to apply the obstetric forceps, and to use quinia, opium, and a dozen other drugs. There must be a minimum standard of knowledge fixed for them; and it must be fixed, not with reference to what a man who is to meddle with that complicated

machine—the human body—should know, but with reference to the demands of society as measured by the value placed upon the services rendered.

We have said that all authors are dissatisfied with existing systems of medical education, and demand something higher and better, but they do not all use the same words in the same sense. American and English writers mean by higher medical education that the average education of the practitioner is to be raised, he is to study longer, and more branches, and to have a more severe examination. But French and German writers mean also by higher medical education that original research should be encouraged, that the science and art of medicine should be improved, that to the student should be imparted not only existing knowledge, but the desire and the power to add to it.

Assuming the superiority of the German Universities, Prof. Billroth thinks that it is due to the fact that they combine the functions of a school and of a learned society. It is the duty of the German professor not only to know the latest advances in science and to teach them, but also to become himself an investigator in, and an improver of, that branch which he is to teach. The result is that his teaching partakes of this spirit of inquiry, and his pupils, or at least the best of them, are trained in this spirit and method, and can often materially assist the teacher while improving themselves. That there are certain dangers in this he sees clearly enough. He points out that the government has the right to demand that the people shall be supplied with competent and trustworthy physicians, and as it is the business of the universities to produce these, they must not let the society predominate over the school in their method of work.

As far as the school functions only are concerned we have indicated some of the causes which are constantly, in all countries, tending to make the education and qualifications of the average physician lower than they should be. But as the character and skill of his nearest physician may be at some time a matter of the gravest importance to any man, be he rich or poor, it is not surprising that attempts should be made to resist this tendency. Professor Le Fort remarks that—

“The theory which in all European nations has governed the organization of the medical profession is this: As the State is morally bound to protect the health and life of its citizens, and as these cannot know whether a certain individual has sufficient knowledge to practise medicine with safety to his patients, the State bestows certain titles upon, and marks, as it were, with the seal of its guarantee, those whom it presents to its citizens as worthy of their confidence. The United States of America alone forms an exception to this rule.”

This same theory, as De Morgan points out, was once applied to the souls of the citizens as well as to their bodies, and it cannot be considered incontrovertible; but we will consider this hereafter. Let us now see how the theory is carried out in three or four of the principal European countries.

In Austria the diploma of Doctor of Medicine from any Austrian university gives to its holders the right to practise throughout the empire,—a privilege formerly held by the Vienna University alone. The preliminary examination of the student is in botany, zoology, and mineralogy, and the certificate of graduation from a gymnasium¹ or high school is also required.

¹ The course of study at the gymnasium occupies eight years, and includes Latin, Greek, German, geography, history, botany, zoology, mineralogy, logic, and psychology. In addition to these, the following are taught, but their study is not obligatory, viz.: modern languages, drawing, singing, and stenography.

It is usually passed about two years after matriculation, but may be passed at any time of the first four weeks of any semester. The examination for the degree of Doctor of Medicine is divided into three parts, known as the three *rigorosa*.

To be admitted to the first *rigorosum* the requirements are, certificates of birth, baptism, and gymnasial graduation, of two years' attendance at the university, with at least ten lectures per week, of having dissected for one year, and of having passed the preliminary examination. For the second and third *rigorosa* there are required, certificates of faculty attendance for five years, of two years' attendance on medical and surgical clinics, of one-half year's clinical study of obstetrics and ophthalmology, and of having passed the first *rigorosum*.

The peculiarities of the medical institutions of Germany are largely due to the fact that, in the latter part of the seventeenth century, the government established a network of medical officials over the country, and organized its own boards of examination for those who desired to become practising physicians, which boards were independent of the universities.¹ This system was intended to secure the best medical talent for the service of the government, but the result was not very satisfactory, and it was found difficult to obtain a sufficient supply of skilled medical men for the military service; and in Austria, Saxony, Prussia, and Russia, schools were established at the end of the eighteenth century for the purpose of educating army surgeons.

In the formation of these German military medical schools, as well as the similar establishment at St. Petersburg, the first idea of the government seems to have been that the civil schools were deficient either in number or capacity. Moreover, they seem to have thought that they could retain physicians after they had got them educated.

Neither of these theories was correct, for the foundation of the difficulty lay in the fact that the position of the army surgeon on duty with a regiment was an inferior one, and distasteful to educated gentlemen. The army officer looked down with quiet contempt and condescension on men who were non-combatants, and knew nothing of military tactics, and, as these positions of medical officers had for a long time been filled by men of the lowest class, it had been found possible to treat them as servants and appendages. Even at the present day, so persistent are traditions and customs in military matters, the majority of men trained in a military academy, when they come to realize the sweets of command, find it difficult to realize that a thoroughly trained physician is their equal, though, in fact, in general education, he is often their superior.

No government has as yet fully comprehended the fact that a fully educated army surgeon—such a one as it would be satisfied to intrust with the care of its troops and officers—can only be obtained and retained by giving him both sufficient pay and social position; and it will probably be a long time yet before the commonplace axiom, that to secure a regular supply of any first-rate article you must at least give the market price, will be accepted as applying to medical officers of the army or navy.

Under the laws relating to State examinations and the central medical board, as no one could practise who had not passed the State examination, it was found necessary to provide for the wants of the poorer districts by authorizing an inferior grade of practitioners, who were examined mainly

¹ For a good account of this organization consult a series of articles by Dr. Bushman, in the *London Medical Times*, 1849, vols. xix., xx.

in surgery and obstetrics, and who corresponded in most respects to the *officier de santé* of France. Since the consolidation of the empire all this has been changed. At the present time any one can practise medicine in Germany without a diploma and without an examination, and the inferior legal class of practitioners is done away with. But no one may call himself, or allow himself to be called, physician (*Arzt*) unless he has passed the State examination, nor doctor unless he has obtained that title by the University examination, and these two titles are sharply separated. The doctor is not a physician (*Arzt*) unless he has passed the State board, and the *Arzt* is not a doctor unless he has passed the faculty board. The man who is neither *Arzt* nor doctor practises at his peril, for though he is not forbidden to do so, yet, if any mishap occurs from his ignorance, he is punished not only by fine, but by imprisonment for a period varying from six months to ten years.

The expenses of passing the State board are less than half those for the faculty, and the examination is more exclusively practical; hence it is selected by the poorer students who seek only a rural practice.

The majority of students pass both examinations, and this is especially necessary for those who aspire to any medical office.

The preliminary examination is known as the *tentamen physicum*, and the same preliminary certificates are required as in Austria. It includes anatomy, physiology, chemistry, physics, botany, zoology, and mineralogy, and is usually passed at the end of the second year of university life. The State examination is divided into four parts, corresponding in all essential points to the Austrian *rigorosa*. In the examination in practical medicine and surgery, the candidate has to treat two or three cases in each branch for about a week, and to present a written account of these cases. In the Austrian universities a thesis for graduation is no longer required, but it is still demanded in Germany, though not always printed.

The number and character of professorial chairs in the medical faculties vary greatly in the different universities, but in all we find three classes of teachers, viz.: professors, extraordinary or assistant professors, and privat docents.

Thus, at Berlin, there are 14 professors, 14 assistants, and 37 privat docents, with about 260 students; Kiel, the smallest university, with 55 students, has 7 professors and 7 privat docents; while Vienna, the largest, with 860 students, has 19 professors, 38 assistants, and about 70 privat docents.

The professors are appointed for life, and at the end of thirty years' service can retire on a pension; they receive a fixed salary from the State or University—a part of the revenue derived by the medical faculty from certain fees, and their lecture fees from the students. The fixed salary is occasionally increased according to the success and reputation of the professor, and the total salary varies from 2000 to 7500 dollars. Any doctor in medicine may be a candidate for a vacant chair, the selection being made by the minister of public instruction from a list of names recommended by the faculty.

The extraordinary or assistant professors are appointed in like manner from among the privat docents. As a rule, their compensation comes only from students' fees, but occasionally a small fixed salary of about 650 dollars is allowed.

The position of privat docent is accessible to all doctors of medicine, and the number is unlimited. Their compensation is from students' fees,

and they may not underbid the regular professor. At some universities they are furnished with rooms, and given a share of the clinics; at others, they receive little or no assistance.

There are no independent medical schools in Germany. No one can open a course on his own responsibility, and the universities alone have the power to confer academic grades. The system of *privat docents*, however, compensates in a great measure for this want of freedom. As the test of fitness for a degree in the university, or for the position of practitioner in the State, is, mainly, the ability to pass certain examinations, and as the salaries of the professors are guaranteed by the State, it is evident that it makes little difference as to precisely when, where, or how the student gets his information, provided only that he really gets it.

There is, therefore, little objection to free, or, as it is sometimes called, "extra-mural teaching," and hence young men of ability can establish themselves as private teachers, demonstrators, etc., in the immediate vicinity of the universities, relying on their own talents and tact to secure pupils. These are the *privat docents*, much of whose teaching consists in giving short courses, of from six to eight weeks' duration, on special subjects. These *privat docents* are subject to certain regulations, and follow in a general way the teaching and directions of the professor of the special branch to which they attach themselves; they are understood to be in training for professorships, and, if they show marked ability as teachers or as investigators, their promotion may be very rapid.

When a professorship becomes vacant in a German university, it may occasion several changes, especially if the position be an important one, because there immediately follows an effort to induce the best man from some other university to come and fill the vacant place, and, if this be successful, then there is another empty chair to fill, and so on. Of course, counter-inducements are held out by the universities which wish to retain their famous men, and thus a sort of auction follows, in which sometimes the article sold, viz., the professor, can almost dictate his own terms. When we use the words "auction" and "sold," we do not by any means intend to imply that it is purely a matter of money. Social position, orders of nobility, handsome residences, or special facilities for scientific pursuits, are some of the various inducements that may be used.

For instance, after the transfer of Strasburg to Germany, neither pains nor money was spared to make the University a success. For the chairs of the medical faculty rising men were selected, all of whom were known for original research and had practically proved their ability as teachers and writers. The chair of pathological anatomy was given to Recklinghausen, one of the most brilliant of Virchow's pupils. When the chair of pathological anatomy at Vienna became vacant by the retirement of Rokitansky, it was offered to Recklinghausen, and the salary proposed was 25,000 francs, or about three times the usual salary of such a professorship. But the Prussian government was quite as anxious to retain Professor Recklinghausen as the Austrian government was to obtain him, and asked him to say what he wanted. His reply was to demand, as the condition on which he would remain, that there should be constructed a large pathological institute, in accordance with his plans, and in connection with the hospital,—an institute which will cost several hundred thousand dollars, and will require a change in the fortifications. His demand was acceded to, and he is hard at work now in Strasburg.

In this way the smaller universities become training schools for the

professors of the larger and wealthier ones, and thus the most powerful stimulus possible is constantly acting on all teachers throughout the two empires.

For instance, the medical faculty of the University of Kiel is in an out-of-the-way place; its average number of students present is about 50, and it has a clinic of about 200 patients in hospital. Yet in this small establishment began to teach Stromeyer, Langenbeck, Frerichs, Cohnheim, and Esmarch. The latter, in fact, is still there, notwithstanding offers which have been made to him from other universities.

Let us now turn to the manner in which these things are managed in France.

In France there are two grades of physicians: the *officier de santé*, or rural practitioner, and the doctor of medicine. For a very full and able discussion of the merits of a system of two grades of practitioners we would refer to a little book containing the debates in the French Legislative Assembly, in the spring of 1847, upon the subject of medical organization in France.¹ At that time the first general medical congress of French physicians was held in Paris, and a new journal, the *Union Médicale*, which still flourishes, had just appeared as the organ of French medical opinion as expressed in the congress. The main points in dispute were, first, whether there should be more than one grade of practitioners, with corresponding differences in the methods of education; second, whether appointments to the professional chairs should be by *concours*.

M. Cousin insisted, in opposition to the opinion of the majority of the physicians, that two grades of medical men were necessary, the *officiers de santé* for the requirements of the people in thinly settled and rural districts, and the superior grade for the sake of medical science. He also held that, while the *concours* was a proper means of selecting the *agrégés*, or assistants, it was not the best way of obtaining professors, and his position in both these questions seems to us to have been correct.

It is by no means easy, from the literature of the subject, to appreciate the existing condition of medical institutions in France, or to learn the causes of this condition.

As her schools have fallen in repute, less and less attention has been given to them by foreign writers, while those French physicians who are really well acquainted with the subject are disposed to be reticent from motives of pride or policy, so that their views must be obtained rather by inference from the points which they specially approve in other countries, and from their cautious recommendations for legislation, than from any direct and positive statements.

It is clear, however, that the hand of a paternal government has been lying heavy upon medical education, and that centralization has been carried to an extreme.

The organization of the great central medical faculty at Paris and its requirements for graduation are probably well known to all our readers, as there has been little change in them for many years. Quite recently, however, a number of reforms and improvements have been projected, which are explained in the article of Prof. Chauffard. The most important of these is the providing of new buildings for the faculty and for clinical instruction, for which purpose the sum of four millions of francs has been granted, one-half coming from the state, the rest from the city.

¹ De l'enseignement et de l'exercice de la médecine, * * par M. Victor Cousin. Paris, 1850. 12mo.

Heretofore the presentation of the degree of bachelor of science has not been required until the middle of the first year of the medical student's course. The result has been that too much of the first year has been occupied with the studies pertaining to this degree, and, as the four years' course required is too short already, it has been decided that the degree of bachelor of science, as well as of arts, shall be required at the commencement of the medical course.

In July, 1875, a law relating to medical education was passed by the National Assembly of France, in which it is declared that a school of medicine may be established in any city which will pay a proper share of the expenses.

In such a school there must be 17 professors, allotted to the following chairs, viz.: Anatomy, Physiology, Internal Pathology, General Pathology and Pathological Anatomy, Hygiene and Legal Medicine, Operative Surgery, Therapeutics, Materia Medica, Botany and Zoology, Medical Chemistry, Medical Physics, Pharmacy, and Clinical Obstetrics, each one; Clinical Medicine and Clinical Surgery, each two.

The salary of each of these professors is 4000 francs, with 1000 more for the director.

There must be eight assistant professors, two of whom are assigned to the natural sciences, two to medicine, two to surgery, one to obstetrics, and one to anatomy and physiology. These assistants are to be selected by *concours* and appointed for ten years; their salary is to be 2000 francs, and they must give three lectures per week. The law then goes into the details of assistants, down to the porters and messengers, specifying their duties and salaries.

Everything is fixed; it is not supposed that the faculty which is to do the work, or the municipality which is to bear the expense, can be trusted to decide even as to the scrubbers, or how much they should be paid.

The city must undertake to meet all the expenses for salaries, fuel, lights, repairs, and books and material. It must also provide two amphitheatres for lectures, an office for the director, a room for the secretary, and buildings including three chemical laboratories, two laboratories for physics, one for pharmacy, one for physiology, etc.

The faculty must have at its disposal in a hospital, founded by itself or furnished to it by the government, at least 120 beds habitually occupied for clinical teaching; there must be two clinical amphitheatres, and each clinical teacher must have a small working-room or laboratory. In short, the details are given so minutely that it is legitimate to infer that as water-closets are not mentioned they are not considered desirable.

The pupils of the free faculty may be examined for degrees by the state faculty on proving that they have followed the prescribed course, or they may be examined by a special board. In 1876 it was enacted that all examinations must be undergone in the state faculties, which is, of course, a very serious limitation to freedom of teaching.—(*Gaz. Hebdomadaire*, 1876, p. 368.)

It is fair to infer that this legislation was intended to prevent any but a large and wealthy municipality from forming a medical school, and to give the name rather than the substance of liberty to teach.

Under the new law the city of Lyons made a formal request of the state for the creation of a faculty of medicine at that place, promising on its part to put up buildings which should cost 5,000,000 francs, and to pay all the excess of expenditures over receipts to the amount of 300,000

frances per year. With regard to the organization of the faculty, a suggestive and valuable report was made to the municipal council by Dr. Gailleton, the conclusions of which were adopted and recommended to the Minister of the Interior. After urging that there should be no chairs of the accessory or natural sciences in the medical faculty, and that chemistry, physics, and natural history should belong to the faculty of sciences, he says :—

“ We would suppress, also, the chairs in which the professors declaim with more or less eloquence on the principles of medicine and surgery. On these subjects a good book is of more use to the subject than a lecture. This teaching is better effected by conferences, and should be reserved for the assistants or free professors. The clinics should be increased, and should include diseases of the eye, of the skin, syphilis, mental diseases, diseases of children, diseases of the larynx, diseases of the ear, and of the urinary organs.”—(*Lyon Médical*, Nov. 1876, p. 333.)

It was also recommended that any doctor should be allowed to open a course or to teach on any medical subject, and the student should have the right to choose his professor. The uniformity of salary for the professor is objected to. This salary has been fixed by the ministry for all the professors at 6800 francs per year.

“ We consider this uniformity of salary as absolutely incompatible with the prosperity of a provincial medical school. The professors must be divided into two classes: the first, devoted to pure science and to laboratory researches, should not be diverted from their work by other occupations; the second, by the nature of their teaching, receive money from practice. The professors of anatomy, of physiology, of pathological anatomy, and of experimental and comparative medicine ought to live in their laboratories, in constant contact with their pupils. The actual direction of the work of the pupils will take all their time.”

It is proposed, therefore, that these professors shall have 5000 francs extra per year. It is also strongly insisted on that in each laboratory there must be an assistant, competent and well paid, and that these are as important as the professors.¹

The result of the consultations is shown by the decrees of April 22d and 24th, 1877.²

The composition of the combined faculty of medicine and pharmacy of Lyons is as follows :—

1st. (25 chairs): Anatomy, 1; Physiology, 1; General Anatomy and Histology, 1; Pathological Anatomy, 1; Comparative and Experimental Medicine, 1; Medical and Pharmaceutical Chemistry, 1; Medical Physics, 1; Natural History, 1; Pharmacy, 1; Internal Pathology (Medical), 1; External Pathology (Surgical), 1; General Pathology and Therapeutics, 1; Hygiene, 1; Therapeutics, 1; Materia Medica, 1; Jurisprudence and Toxicology, 1; Operative Surgery, 1; Clinical Medicine, 1; Clinical Surgery, 1; Clinical Obstetrics, 1; Clinical Ophthalmology, 1; Skin Diseases and Syphilis, 1; Mental Diseases, 1.

2d. Two supplementary clinical courses: Diseases of Women, 1; Diseases of Children, 1.

The number of assistant professors (*agrégés*) is to be 22. Three of these are assigned to clinical medicine, one to jurisprudence, one to therapeutics, two to mental disease, six to clinical surgery and obstetrics, one to anatomy, one to pharmacy, etc.

¹ See *Lyon Médical*, 19 Nov. 1876, xxxiii., p. 440.

² *Union Méd.*, April 28, 1877, p. 705.

One-half, designated by lot, serve for three years, the other half for six years. The appointments are to be by *concours*.

The medical faculty of Paris consists of 29 professors, and about 30 *agrégés*, or assistant professors. As fixed by decree of Jan. 14th, 1876, the salary of a professor is fixed at 13,000 francs, and that of the *agrégé* at 4000 francs. The number of students is about 6000, and the annual number of graduates about 500. The Paris school has, therefore, a larger number of medical students than all the German universities together, but its students are nearly all French, while to the Austrian and German schools they come from all parts of the world.

The systems of medical education and of medical polity in all the countries of Europe, with one exception, correspond to either that of France or that of Germany. The exception is Great Britain, and the peculiarity here is that there are no State medical schools. The schools are private corporations, and the examining and degree-granting powers are also private, though distinct corporations.

All that the government undertakes is to publish an authentic list of qualified practitioners, and to define the minimum of qualification which shall entitle a physician to be recorded on this list.

This is done through the agency of a body known as the General Medical Council, which may be considered as a sort of medical representative body of the larger medical corporations. The reports of the last meeting of this council, published in the *Lancet*, *Medical Times and Gazette*, and *British Medical Journal* for May and June, 1877, will be found to give a very good idea of the existing condition of medical education in Great Britain; and, as far as the formation of practitioners is concerned, the results may be said to be fairly satisfactory. The principal complaint made is that of defective preliminary education in the candidates, and that the time for medical studies (four years) is too short. The professors' fees are derived entirely from the students.

We can now, perhaps, appreciate the difference between the French, German, and English systems of medical polity and of medical education, which are in many respects well marked. In France, the State undertakes to play the principal part; the schools are State schools, physicians are State officials. Substantially, thus far, the effect of the State control has been to centralize instruction in the Paris school. The recent law with regard to the formation of free faculties has as yet had little effect; and in fact there is little freedom possible so long as the State on the one hand fixes the courses of instruction and the requirements for graduation, and on the other hand bestows such pecuniary aid on its own favoured institutions that it is almost impossible for any school not thus assisted to compete successfully with them. In Germany the connection between State and school is less direct, the attitude of the State being that of protection and encouragement rather than of immediate direction; nevertheless the schools are essentially State institutions, and cannot go far out of a certain course without being "protected and encouraged" back into it. The marked difference between France and Germany is the number of schools all nearly on an equality, and the healthy competition and friendly rivalry which are thus insured. The German universities are great corporations, with special powers of jurisdiction over their inmates, and it is considered a special honor and privilege to come under this peculiar jurisdiction. The French school has no such privileges.

In Great Britain the State has but little to do with the matter. The schools themselves, through their representatives in the council, regulate all matters of education, and there is practically no law against irregular practitioners or quacks. All that the State undertakes is to see that the schools, through their council, shall furnish to the public an authoritative list of qualified practitioners.

In a few of the older universities certain professors are appointed by the Crown, but by far the greater number are selected by the schools themselves. The fees of the professors are not guaranteed or regulated by the State, and there is no retiring of professors on a pension.

The condition of medical education in this country may be briefly summed up as follows:—

There are now 65 medical schools in the United States, besides those devoted to homœopathy, eclectic and botanic systems, etc. During the winter of 1876-7, these 65 schools had 7141 students, of whom 2313 graduated as doctors of medicine in the spring of 1877. There were employed in these schools 515 professors, and 279 other teachers with various titles.

In five of these schools there is a graded course of three years, and in two a preliminary examination is required, although of a low grade. Of the remaining schools about 15 are doing fairly good work, work as good as there is a demand for, and are prepared to improve as rapidly as public opinion and financial necessities will permit.

The rest of the schools are doing poor work, and will probably continue to do it. Many of them owe their existence to the desire of two or three gentlemen to advertise themselves without coming under the ban of the Code of Ethics. What an individual may not do is yet permissible to a corporation. The profit from such schools does not come from the fees of the students, but from the advertisement, and from the consultation cases which the graduates bring to the professors. They can well afford, therefore, to accept low tuition fees, or even to teach without fees. It is useless to discuss methods of improvement for this class of schools; the only useful reform is one that will put an end to their existence.

The amount of general education and time of study required by our medical schools are about the same as, or perhaps a little less than, those required for veterinary medicine abroad.

It is assumed that students coming up for their first course have been reading with a private preceptor for about one year.

“But those subjects which should be studied first are precisely those which require demonstration by means which are not at the command of private teachers, and especially of those in the rural districts. The result is that the medical student, instead of studying chiefly anatomy, chemistry, and physiology, does his reading on these subjects in a mechanical, listless way, and gives his real attention to works on practical medicine and surgery, because he has some cases shown him almost every day.”

This “American system,” as it is called, although it is only entitled to this name because it has been retained in America after the rest of the world had dropped it, is really one of the great causes of difficulty in the way of putting our systems of medical education on a satisfactory footing. The day of apprenticeships and private pupilage has passed for all students who know their own true interests, since the time which they thus spend is for the most part wasted, being taken from the time which should be given to laboratories, hospitals, and lectures. Many members of the

medical profession, however, are, and will be, reluctant to give up this business of preceptorship. "It adds a little to their income, and more to their importance; it makes them professors in a small way, puts some patronage into their hands, gives them an office boy or two, and need be no trouble unless they choose, and in most cases they do not choose."

All attempts to compare the practical skill of, or the results obtained by, the physicians of the United States with those of other countries are worse than useless, nor in fact is it probable that the methods of treatment differ much, for, thanks to medical journalism, the art is now cosmopolitan, and a new remedy reported from England or Germany will very speedily be tried here. As far as surgery, and especially what may be called mechanical surgery, is concerned, the comparison is certainly favourable to this country. When, however, we come to compare our medical literature with that of other countries, the result is not gratifying to our national pride; and, after all, it is by this that we must be judged. A "doctor" should be a teacher as well as a practitioner, and his duties do not end with the cure or death of his patient. He ought, for the sake of the profession and the public, to set forth the how and the why of his results.

Defective education shows its effects in omissions as well as commissions, and in this respect we can only plead guilty. The various attempts which our physicians have made to produce a change for the better have not as yet produced any striking results, but the attention of the non-medical public, which is after all the party most immediately interested, and is probably the only source from which effectual reform can be expected, has been to some extent aroused, so that it is probable that in the course of time our legislators will provide some means by which the public can distinguish the properly trained physician. It is very evident that our young men must be much more studious and intelligent than those of France, Germany, Sweden, or Great Britain, or else that they must be less well informed on graduation, since but two years of study are required here for that purpose. It is also clear that the course of reform in our medical education has been something like that of reform in the civil service. Every one agrees that it is a most desirable thing, but the majority is opposed to any particular mode of effecting it.

The causes of the dissatisfaction which exists are easily understood; they are even on the level of the understanding of the western Bunsby, who argued, loud and long, that the horse could never trot a mile in two minutes, "because the distance was too great for the time."

The defects in the American system of medical education are summed up by Dr. Pepper as follows:—

"1st, the absence of a preliminary examination; 2d, the very short term of studies required; 3d, the want of personal training in the practical branches; 4th, the absence of any grading of the curriculum; 5th, the examination of the candidates for the degree by those having a direct pecuniary interest in their success."

The evil result of these defects upon which he lays most stress is the over-production of medical men. He estimates that in the United States the proportion of physicians to population is 1 to 600, while in Austria it is 1 to 2500, in France 1 to 1814, in the German Empire 1 to 3000, in Great Britain 1 to 1672, and in Sweden 1 to 7500. These estimates are based on special official reports obtained through the State Department, and the summary of these reports, given in an appendix to the address, forms a very valuable contribution to the statistics of this subject.

Intimately connected with the excessive production of improperly educated medical men is the prevalence of quackery and the sale of fraudulent diplomas, and also the abuse of medical charities by establishing free dispensaries to furnish clinical material for the medical schools.

It will be found interesting to compare with Dr. Pepper's address the Carmichael prize essay for 1873, by Dr. Ashe. The Carmichael prize essays are the result of a bequest of £3000 to the College of Surgeons of Ireland, the interest from which is to be awarded every four years to the best essay upon the state of the medical profession in Great Britain and Ireland, on the state of the hospitals and schools of medicine, and on the state and mode of examination or testing the qualifications of candidates of the different licensing colleges or corporations in medicine, surgery, and pharmacy.

Dr. Ashe finds that in Ireland there are at least 24 per cent. more physicians than are needed, and that to this supernumerary 24 per cent., "it is due that the public can treat us as they please, can pay us fees or not as they choose, can send for us any distance, or require from us any length of attendance, and then pay us at their own tariff." The poor law medical officers attend districts varying from fifty to one hundred and fifty square miles in extent, at salaries varying from 7s. to 2s. 9d. per day, and "so indiscriminate is the character of the poor law medical relief that practice is almost abolished, as every one can obtain a ticket if he only asks for it."

"Yet, when one of these appointments falls vacant, what happens? A rush is made from all quarters, as if to a newly discovered Australian gold reef. In the hope of making something by the sale of medicines in an unoccupied district, men, mostly young men, flock in from towns like those we have spoken of above, where there are two or three doctors per 1000 inhabitants. Active canvassing goes on, for is not 4s. 6d. a day with a shop better than the shop without the 4s. 6d., even though severe labour has to be incurred, and the expense of a horse and man has to come out of the 4s. 6d.? Of course the committee conclude, that, as there are so many applicants, they have offered ample remuneration. If an increase of salary is afterwards asked for by the successful candidate, they oppose it, on the grounds that they can get plenty of eager applicants at the same salary, so the doctor can go if he is dissatisfied."

The remedy proposed by Dr. Ashe is to increase the severity of the preliminary examinations, so that about one-third of those now passing shall be excluded. He frankly avows that this limiting of numbers is trades-unionism, pure and simple, but contends that it is trades-unionism only in its legitimate feature, in order to place physicians before the public in the position of parties to a contract for their services, instead of suppliants for employment at any time.

Let us turn now to the remedies proposed for the condition of things in the United States. As far as protection to the public from incompetent practitioners is concerned, the majority of the medical profession are probably of the opinion that the government should interfere in some way, but in what way is by no means generally agreed upon. It is clear that it is a matter that is under the jurisdiction of the several States, and that Congress can do nothing directly. All that the General Government can do is to encourage a high standard of education in its medical officials, and to provide facilities for medical teachers and writers in the shape of a national medical library and museum. It would also be possible for it to publish an official medical register, in which the degrees obtained by each physician should be noted; but this would be of little use, because the degrees under existing circumstances are of little value.

Dr. Pepper thinks that each State should prescribe the number of years to be devoted to medical studies before graduation, and should create a State board of examiners, who alone should have the right to confer licenses to practise within the limits of the State. This would probably be an effectual remedy, provided that public sentiment would permit the infliction of penalties upon those who practised in violation of the law. Such a public sentiment does not exist at the present time, and we do not believe that it will exist for a long time to come. Compulsory and official registration of practitioners seems much more practicable, and we should be glad to see this experiment fairly tried. As a commencement, and for the purpose of obtaining information, we should be glad if the next census could register them all, good and bad, somewhat after the plan proposed by De Morgan.

"Let the Register give the name, address, and asserted qualification of each. . . . Let it be competent to any man to describe himself as qualified by study without a diploma, . . . or even by intuition or divine inspiration if he please. Let all qualification which of its own nature admits of proof be proved, as by the diploma or certificate, etc., leaving things which cannot be proved, as asserted private study, intuition, inspiration, etc., to work their own way.

"Let it be highly penal to assert to the patient any qualification which is not in the Register." (De Morgan, A. A., *Budget of Paradoxes*, London, 1872, 8vo., p. 160.)

In addition to this, De Morgan proposed to make it a penal offence to practise if unregistered.

His suggestion was given half in jest and half in earnest, and it is plain that the value of an annual official Register of Physicians, such as is now issued in Great Britain, would be destroyed to a great extent were every claimant included; but for statistical purposes, and to give some positive data for legislative action, it seems worthy of consideration.

In view of the defects complained of, how does it happen that the great majority of our practitioners are fairly skilled in their art, and that the results of their treatment will compare favourably with those of foreign physicians? We suppose it is because the majority of them gain the most valuable part of their skill at the expense of their first patients. How else can they get it, at least as regards internal therapeutics? As far as mechanical surgery and those specialties which depend mainly on mechanical appliances are concerned, it is easy to see why preliminary education and general culture are of minor importance. It should also be remembered that a very considerable proportion of the medical profession in this country have not limited the time of their studies to the usual two years' curriculum. Many of them have studied three years, a goodly number have added a fourth year in hospital service, and over one per cent. have studied in foreign schools. If a man wants a really skilful practitioner there are few localities in the United States where he cannot be found or brought without much trouble. Let it not be supposed that we consider the condition of things satisfactory. Far from it, but we are just now considering the question of the supply of practitioners for the people, and it seems to be not so bad after all, being nearly as good as there is a demand for, which, according to political economists, is the main point, and it is from this point of view that the public and its representatives, the legislators, must view it.

From the point of view of the well-educated physician the case is different. Small wonder that he should feel discontented when he sees the sort of men with whom he is classed by the public. His only hope for im-

provement, however, must be in the education of this public. As far as the better class of schools are concerned, it is difficult for them to effect improvement, but it is by no means impossible. The experience of Harvard and of the University of Pennsylvania shows that extending the course of study to three years will be a financial success. Far more important, however, than lengthening the curriculum, is the establishing a satisfactory preliminary examination. It is at the very beginning that incompetent men should be rejected, and this for their own sake.

No such examination has yet been tried in this country, nor can it probably be maintained by an institution which is not so endowed as to be comparatively independent of the students' fees. These fees in fact are but a small proportion of the cost of properly educating a medical man, which is about two thousand dollars. Billroth estimates the cost to a university of a course of five years, such as he recommends, as being about \$2500 for each student, and his chapter on this subject will be found especially interesting.

Thus far we have been considering the subject of medical education from the point of view from which the majority of authors and essayists view it, namely, as designed to produce medical practitioners,—as fitting men for the art or handicraft of medicine. This is the article for which the demand is evident, and the supply corresponds. We have plenty of *officiers de santé* in this country, too many, in fact; but it is not so clear that we have too many doctors, using that title in its proper sense.

What is the prospect in this country for the production of men qualified to teach medicine and the cognate sciences, and to carry on original research? We think it probable that this also we may hope to see accomplished. A new university is just now taking shape in Baltimore which has, to a great extent, the means to undertake this special work, and the authorities of which are now considering this problem of medical education with reference to the mode in which they should organize their medical department. Let us hope that their decision will be a wise one, and that a sufficient number of young men may be found in this country to appreciate the opportunity which will thus be afforded them.

At the present time the duty of those physicians who wish to see our present system of medical education improved is plain. They should exert their influence in favour of those schools which have adopted the three years' course, which have good laboratory and clinical facilities, and which exact the greatest amount of preliminary education in their students. They should advise their young friends and pupils to go to these schools, and to avoid others, and show them that it is to their own interest to do this.

As to legislative restrictions on the practice of medicine, we doubt the policy of urging them by members of the profession. Any law which accepts a diploma as evidence of competency is especially objectionable, for it offers a premium to schools of a low grade. This objection applies also to registration laws, but in a less degree. The special value of registration is that it will furnish some positive data, and thus enable those who are really and practically interested in the subject to see precisely what is the extent of the evil which they propose to combat.

J. S. B.

- ART. XIX.—*The Retinal Red and its Relation to the Sensation of Sight.*
Zur Anatomie und Physiologie der Retina. Von F. BOLL. Berliner Acad. Monatsberichten, 1876. S. A. 5 Stn.
- Zur Photochemie der Netzhaut.* Von W. KÜHNE. *Über den Sehpurpur.* Von W. Kühne. Ergänzungsheft zu den Verhandlungen des Naturhistorisch-medizinischen Vereins zu Heidelberg. B. 1, H. 1, 1877.
- Zur Physiologie des Sehens und der Farbenempfindung.* Von F. BOLL. Berl. Akad. Monatsber., 11 Jan. 1877, 7 Stn.
- Nachträgliche Zusätze zu dieser Mittheilung.* Ebendas, 15 Feb. 3 Stn.
- Der Sehpurpur beobachtet im Auge eines gehenkten Menschen.* Von Prof. SCHENK und Dr. ZUCKERKANDL. Allgemeine Wien. Zeitschrift, N. 11, 1877.
- Zur Farbe der Netzhaut.* Von E. FUCHS. Wien. Med. Woch. N. 11, 1877.
- Ueber die Verbreitung des Sehpurpurs im Menschlichen Auge.* Von W. KÜHNE. *Weitere Beobachtungen über den Sehpurpur des Menschen.* Von W. KÜHNE. *Das Sehen ohne Sehpurpur.* Von W. KÜHNE. *Untersuchungen über den Sehpurpur.* Von A. EWALD und W. KÜHNE. Ergänzungsheft z. d. Verhand. des Nat.-Hist.-Med. Vereins zu Heidelberg, B. 1, H. 2, 1877.
- Ophthalmoscopische Mittheilungen über den Purpur der Retina.* Von Dr. HELFREICH. Centralblatt f. Medic. Wissen. N. 7, 1877.
- Untersuchungen über die Wahrnehmbarkeit des Sehpurpurs mit dem Ophthalmoskope.* Von Dr. M. J. DIETL und Dr. FERD. PLENK. Centralblatt für die Med. Wissen., 16, 1877.
- Ueber die Diagnose des Sehpurpurs im Leben.* Von Dr. E. A. COCCIUS. Leipzig, 3 Juni, 1877.
- Ueber die Darstellung von Optogrammen im Froschauge.* Von W. KÜHNE. *Untersuchungen über den Sehpurpur.* Von A. EWALD und W. KÜHNE. Ergänzungsh. z. d. Verhand. des Naturhist.-Med. Vereins zu Heidelberg, B. 1, H. 3, 1877.
- Zur Anatomie und Physiologie der Retina.* Von F. BOLL. Arch. f. Anat. u. Physiol. Physiolog. Abth., 1877. S. 4–36.
- Zur Lehre vom Lichtsinne.* Von E. HERING. Wiener Sitzungsberichte, v. 66, 68, 69, 1872–1874.
- Die Macula lutea, anatomisch und ophthalmoscopisch.* Von HERM. SCHMIDT-RIMPLER. Arch. f. Ophthalm., xxi. 3, p. 17, 1876.
- Études chimico-physiologiques sur les matières colorantes de la rétine.* Par STEFANO CAPRANICA. Annales d'Oculistique, T. lxxviii, p. 144, 1877.

THE theory of vision, proposed by Dr. Young about the beginning of the century and afterwards revived by Helmholtz, after holding undisputed sway for a number of years, seems at last about to be dethroned. The first effective attack was made upon it by Prof. F. Boll, of the Royal University of Rome, when he announced that the retina contained a red colour that quickly disappeared on exposure to light. The retinal red, according to Boll, is best demonstrated in the eye of a frog (*Rana temporaria*) which has been kept in a dark place for several hours. The eye is then enucleated by the aid of a feeble artificial light, cut in half, the retina taken

out and laid upon its inner side upon a white surface. If now examined by a good light, the purplish-red colour of the membrane is very evident. In 10 to 20 seconds, however, the rosy tint vanishes, to be replaced by a yellowish, satiny lustre, which lasts from 30 to 60 seconds. Gradually this also disappears, and the retina becomes transparent and colourless. In this condition it remains for perhaps a quarter of an hour, but at last is found to be white and opaque. Microscopical examination shows that the red colour, as well as the yellowish tint of the second stage, is exclusively confined to the outer segments of the rods. The white, opaque appearance of the last stage is owing to the coagulation of the albuminous matters in the other layers of the retina. These peculiarities of the membrane may be found in nearly all animals which possess a retina with rod and cone layer, but last longer and are more easily observed in the amphibia and cartilaginous fishes, which have retina with large rods, than in the mammalia and bony fishes, which mostly have fine rods and cones. In the mammalia the colour-changes take place so rapidly under the influence of light that it is difficult to observe them. In crabs and cephalopods, on the other hand, the colour is especially well marked and enduring. In the frog, however, the microscope shows that all the rods are not red. A small proportion of them are of a bluish-green colour.

Dr. W. F. Norris and the writer have together repeated some of Boll's experiments and those of other investigators, as will hereafter be mentioned, and have always been successful in obtaining the above-described results with the frog's retina. In the microscopical examinations we found that the green rods were in a varying proportion of from 1 to 5 or 10 of the purplish ones, and that after the latter had become quite colourless, the former were still visible, but lighter and more bluish in colour. Indeed, the green rods apparently increased in numbers as the red ones faded.

Schenk and Zuckerkandl have also observed the retinal red in eyes removed from criminals after execution, and E. Fuchs has ascertained its existence in the eyes of still-born babes. The retinal colour has been studied, with persistent industry and a vast consumption of material, by Kühne, of Heidelberg. He has published a series of papers on the vision purple, and was probably the first to take a successful optogram. He recommends that the experiment should be tried on an atropinized and curarized rabbit, whose refraction has been previously determined by the ophthalmoscope. The subject of the picture usually taken was a window, with narrow pieces of board tacked to the frame and cross-bars so as to exclude much of the light and make an easily recognizable object. The animal was placed in the room in front of, and somewhat below, this window, at a distance of 1.75 m. After 10 minutes' exposure, the rabbit was killed and the eye extirpated in a dark room, by the aid of a sodium flame. The bulb was opened and placed in a 5 per cent. solution of alum, in order to make the retina tough enough to allow of its removal. After remaining in the alum solution for twenty-four hours, the eye was halved, the optic nerve entrance cut out with a punch, the retina detached under water and floated on to a porcelain scale, so that its outer surface should be upwards. Examined by daylight the picture was barely visible. Two minutes after the death of the animal the other eye was placed in position for receiving the image of the window, and treated as before. The picture obtained in this eye was very good. Several repetitions which we made of this experiment were uniformly unsuccessful. We always found the retinal red of the rabbit so faint as scarcely to admit of a bleached spot being seen. Indeed, Kühne says

that any light strong enough to see the optogram by, is strong enough to bleach it, and subsequently recommends that the retina should be dried in an exsiccator, over sulphuric acid, for twenty-four hours before examination. In this way the colour is fixed for a time. We found this to be the case with frog's retinas.

Kühne claims to have obtained excellent optograms by using the eyes of oxen, even an hour after death. In the living frog, also, he got a good picture of a gas-flame, in front of which the animal had been induced to sit quietly for two hours. In all these cases no picture can be seen on the front of the retina, if it be examined at once and *in situ*, but only after removal from the eye is the picture visible in the back of the membrane. His remark that it is useless to attempt to take optograms unless one has plenty of time to devote to the subject, is, according to our experience, perfectly accurate.

Boll soon after published a paper in which he gave a *résumé* of the facts connected with his discovery, and mentioned that he had placed a curarized frog in such a position, behind the almost closed shutter of his window, that the thinnest possible ray of sunshine admitted between them should fall upon the animal's eyes. After ten minutes' exposure the eye was removed, and the retina found to be divided into two lateral red-coloured halves by a vertical white line.

Kühne, however, is of the opinion that an optogram is not so readily taken as this result would seem to indicate. He repeated the experiment, and ascertained that on account of the sun's apparent motion "the thinnest possible ray of sunshine" would not remain on the frog's eye for ten minutes. This difficulty, however, he met by the use of a heliostat. He then found that an exposure of twenty minutes instead of ten was necessary to produce a perceptible line, but even then it was not well defined. From our own experiments we should be disposed to consider the line described by Boll as probably accidental. Such streaks occasionally occur without obvious reason in retinas which have been exposed to strong light. Perhaps it may have been caused by the absolutely necessary use of the forceps in the removal of the membrane from the bulb. From a variety of experiments Kühne deduced the conclusion that the distance of distinct vision in the frog's eye was from 12 to 50 centimetres. The best distance is probably about 15 centimetres. He also found that if the retina is bleached quickly, in a bright light, the pigment cells adhere to it and obscure the picture. This is quite in accordance with our own experience. He therefore adopted as a test object a pane of ground glass, 45x55 centimetres, on which were pasted five strips of black paper, each 5 centimetres wide, so that the entire pane was divided into alternate translucent and opaque stripes. The curarized frog was placed on a cushion of soft black wool, its eyes made prominent by means of a paper ball in its mouth, and at the distance of 15 centimetres subjected to the mild light coming through this pane for an hour or more. The picture taken in this way covered half the retina. We repeated this experiment on a dozen different eyes, and in three cases only with satisfactory results. We found that the best subjects for the trial were very large specimens of the *Rana pipiens*, one of those we used measuring over thirteen inches in length. In a single instance only were the stripes visible on the retina in red and white. In the other two cases lines of adherent pigment marked the places where the bands of light from the window-pane had been focused, so that the image appeared reversed, in white and black.

It is probable, however, that this proportion of successful results may be considered satisfactory, for the causes of failure, such as too long or too short exposure, variations in light intensity, the difficulty of removing the retina entire and without distortion, and the troubles attendant upon the manipulation of so small an object as a frog's eye, are so numerous that even Kühne admits that he sometimes failed. Our best picture was taken after an exposure of only 45 minutes, with the sun shining on the pane. When the glass transmitted the light from a blue sky only, two hours were required to produce the optogram.

In another paper (*Zur Photochemie der Netzhaut*) Kühne discusses the effect of other agents than light upon the retinal colour. The tint is destroyed by a temperature of 100° C., by alcohol, acetic acid and by a 10 per cent. solution of soda. It is not affected by a 5 per cent. solution of common salt, strong ammonia water, 2 per cent. solution of acetic acid, alum, glycerine, ether and drying. The rays of light at the spectroscopic line D have almost no effect on the colour, and in this connection it is remarkable that only the most deeply tinted retinas, for example those from the *Rana temporaria*, exhibit to the observer a perceptible tinge of red when viewed by the sodium light. The colouring substance is separable from the retina by solution. Kühne puts about twenty retinas, freshly taken from frogs' eyes, into from half a gramme to one gramme of a 5 per cent. watery solution of crystallized and colourless ox-gall, in a small test tube, lets them stand for forty-eight hours, and filters. The resulting solution is perfectly clear, and of a splendid carmine-red colour. Exposed to light it becomes first orange, then yellow, at last colourless as water. In direct sunshine the bleaching is instantaneous. In diffused daylight the fading varies in rapidity according to the light intensity. The colour is perceptibly slower in disappearing in the afternoon than in the morning, or at mid-day. In this respect it is like other photochemical agents. The colouring substance probably exists in the retina in solution, for if a fresh retina is made to adhere to a glass slide, and this is exposed to light in a vertical position, the lower edge of the membrane always bleaches last; and if a row of retinas are thus placed, touching one another, the lowest retains its hue many minutes longer than the highest.

According to Boll the colour of a retina, which has been for some time in obscurity, is red, corresponding to the middle of the spectrum red. He suggests the name *Erythropsine* for the colouring matter. A. Ewald and W. Kühne made a large number of experiments (*Untersuchungen über den Sehpurpur*) to determine the precise shade of the retinal tint. They endeavoured, by means of the well-known method of Helmholtz, to find the hue which would combine with that of the retina to make white, and finally concluded that the complementary colour is pure green, that part of the solar spectrum between E and b. Analysis of the colour by means of the spectroscope was found to be unsatisfactory on account of the rapid change of tint under the action of light. They conclude, however, that the colour is purple, and name the colour-giving material *Rhodopsin*.

Under the influence of the ultra violet rays of the solar spectrum the retina becomes fluorescent. The purple rods appear blue. If bleached they look green, and still more fluorescent. The anterior layers of the retina become faintly bluish. An optogram examined by these rays shows a green picture on a blue background. Ewald and Kühne suggest the possibility of seeing an optogram *in situ* in the living human aphakial eye by means of the ophthalmoscope, using the ultra violet rays. When it is

remembered, however, that their illuminating power is so slight that they cannot be seen when focussed on white paper, it must be confessed that such an examination would be accompanied with some difficulty. The ophthalmoscope, indeed, has not yet made the retinal red quite clear in the living eye. Helfreich, it is true, claims to have seen the retina of a rabbit bleach in eight minutes after section of the cervical spinal marrow, and to have then examined the other eye, which had been shaded, and found the colour of normal brightness. Boll also claims to have seen the retinal red with the ophthalmoscope, in the eye of the guinea-pig, and says that in all the mammalia the characteristic colour can be detected in this way until twelve hours after death, and thinks this fact might be of use in medico-legal cases. In his opinion there are three factors concerned in the production of the red reflex from an eye-ground viewed with the ophthalmoscope. They are: 1. The Erythroptine. 2. The blood in the choroidal vessels. 3. The red in the artificial light generally used. The last factor could of course be eliminated by using white or monochromatic light. Boll perceives a great difference in the depth and intensity of the colour of the human retina according to whether it is examined immediately after a night's sleep or late in the day, and on this bases an experiment for the subjective demonstration of the retinal red. He says that if upon first waking in the morning, in a dark room, the eyes are exposed for a moment to bright sunlight and instantly closed again, the whole field of vision will appear of a lively red, intersected with the spider's-web-like outlines of the capillaries, and marked by the macula lutea, of a ferruginous tint. All this presently fades, but the verification may be obtained several times before the colour finally becomes too faint to be distinguished. Dietl and Plenck, however, deny the possibility of seeing the retinal red with the ophthalmoscope. They say there is nothing of the kind to be seen in the frog, and this observation is amply confirmed by our own experiments. We found the image of the flame thrown on the retina to be grayish-white, and, except in the bloodvessels, no trace of colour visible. Yet the same membrane, removed from the eye, always showed the proper tint in profusion. Kühne endeavours to explain this by showing that lake-coloured fluids cannot be distinguished from black if placed on a dark background. He says that a drop of blood made lake-coloured, and placed on black paper, cannot be distinguished from a drop of ink by its side. Boll, however, claims that the red can be seen *in situ* in the frog's eye by emptying out the refractive media, and looking at the retina obliquely with the ophthalmoscope. This does not agree with our own observations, for the only colour we have been able to obtain in this way was in spots where the pigment layer had been accidentally detached, and light shown through the sclera and retina from behind. The pigment layer is so dense in the frog's eye as to render the parts covered by it perfectly opaque.

Dietl and Plenck took a rabbit, which had been kept in the dark, bound up its eyes and injected milk in one carotid while they bled from the other. The ophthalmoscope now showed the retina of a pure white. They then injected blood again until the eye-ground was red from filling of the choroidal vessels. Fifteen minutes later the retina, examined on a ground-glass slide, was found to be of a pale red. Coccius took the extirpated eye of an ox, which had been kept in the dark an hour before death, punctured it a few lines behind the cornea, and introduced a probe. Where this probe touched the retina the ophthalmoscope showed a ring of red surrounding it. If a little fold of the retina was pushed up, a streak of red

appeared, which vanished again when the retina became smooth. If the retina was turned slightly round, the purple appeared in abundance. A trial of the same method in a live rabbit resulted in the same way. In this case, the retina becoming torn, effused blood obscured the eye-ground except in one place where the proper colour was plainly visible. The writer has made a number of experiments on human beings by excluding the light from one eye for several hours with a bandage, while the other eye of the same person was left free. Subsequent ophthalmoscopic examinations always failed to show any difference of tint between the two retinas.

Boll and Kühne have both investigated the effect of monochromatic light upon the retinal colour. The former found that red light intensified the hue at first, and caused it to fade very slowly. Under this illumination the microscope showed the green rods in the frog's retina becoming brighter. Yellow light affected both the red and green rods very slowly. Green light acted quickly on the red rods, but apparently caused the green ones to increase in number. Blue and violet rays acted like green. Under their influence the number of the green rods was apparently doubled, and they remained plainly visible for some time after the red ones became colourless. Ultra violet rays had no effect on the colour of the rods. Kühne also observed that the grass-green rods in the frog's retina do not bleach in green light. He placed on a screen a sufficient number of frog's retinas to cover the entire solar spectrum, and exposed them simultaneously to its influence. The bleaching commenced in greenish-yellow, and passed successively through yellowish-green, green, bluish-green, greenish-blue, blue, indigo, and violet; later through pure yellow and orange; much later through ultra violet, and finally through red. Rabbits' retinas bleached most quickly in the part of the spectrum between D and E. He found that the human retina bleached in blue to violet in 12 minutes, in green in 25 minutes, while in red the colour lasted 8 hours. Ewald and Kühne afterwards repeated the experiments on frogs' retinas with results slightly varying from the foregoing. They conclude, however, that the bleaching commences at the line E of the spectrum, and advances through green and blue to violet; then commences in yellow, and passes through orange, red, ultra violet and ultra red. Under green, however, although the retinal purple quickly changes to yellow, the complete decomposition takes place afterward more slowly. Under violet, on the contrary, the change to yellow is made very slowly; but once accomplished, it quickly fades to white. So that traces of yellow may still be seen under the green rays after all colour has disappeared under the violet. From this they infer that visible light acts on the retinal red with varying intensity, according to the colour of the rays, and that the wave lengths which most quickly change the retinal purple to retinal yellow act most slowly on this latter, while those waves which have least effect on the purple, act most quickly in changing the retinal yellow to retinal white.

The regeneration of the retinal red is not due to the circulation of the blood in the vessels. Kühne found that if a frog's eye is cut out, opened and exposed to the light, the colour is reproduced for some time as well as if the eye were in its proper place in the living body. If the posterior half of such an eye is pulled and twisted so as to throw the retina into folds, and the light is then allowed to shine upon it, the retina will be found after removal from the eye to be white where the folds were but red as to the other parts. If a frog is placed in the sun for several hours, and the eyes are then removed, the retinas will be found completely

bleached; but if one of these eyes is laid in the dark for an hour, and then examined, it will have regained its colour. If the retina is carefully loosened from a lateral half of the posterior portion of a frog's eye, and a thin scale of porcelain is inserted to prevent the membrane from coming in contact with the parts beneath, and the whole is then subjected to the action of light, the raised half will be quickly bleached. If the porcelain scale is now removed, the retina replaced in position, and the eye put in the dark for a few minutes, the membrane will regain its colour. A piece of the retina may even be cut out and allowed to bleach on a plate, but if carefully replaced in position in the eye the colour is quickly restored.

Ewald and Kühne made further investigations in this direction, and found that if a retina, free from pigment cells, is held in the light until bleached, and is then placed in the dark, it will regain its colour in an hour or so. This experiment may be several times repeated with the same retina. If bleached in the living eye, however, the colour cannot be restored in this way. If the retina is removed from the eye with its pigment cells attached, the regeneration of the red is still more pronounced; but in neither of these cases is it so perfect as when the retina is laid back in the eye. We have verified most, if not all, of these results with the retina of the frog (*Rana temporaria*). Ewald and Kühne state that the solution of retinal purple in ox gall, previously mentioned, also possesses the power of regenerating its colour in the dark, and attribute this faculty to a substance which they suppose to be secreted by the pigment cells, and which they name Rhodophyllin. The pigment cells macerated in solution of gall yield a purple of peculiar intensity. Boll considers that the minute yellow globules found in the pigment layer of the frog are feeders or reservoirs of retinal red. When frogs are kept in the dark all the globules are equally coloured. But if a frog is put in the sunlight until its retina is bleached, and it is then kept in the dark for an hour, many of the globules will be found to be pale, and numbers of them quite colourless.

That the pigment cells manufacture the retinal red is supported also by anatomical considerations. It is well known that these cells send down fine filamentary processes into the interstices of the rods and cones, and these processes seem to be contractile and influenced as to their length by the amount of light thrown upon them. Boll has shown that the retina is most easily separable from the pigment layer in eyes which have been kept in the dark or in red or yellow light. It cannot be removed without tearing or without masses of pigment clinging to it from eyes which have been subjected to white, green, or blue light. When eyes of the former class have been hardened in alcohol, the microscope shows that the interstices of the rods are free from pigment; while the latter class treated in the same way exhibit cordons of pigment extending to the base of the rods at the *membrana limitans externa*. With regard to the structure of the rods and cones, Boll claims that the external segments are really composed of very thin plaques, of which the plaques described by Schultze (.0005 mm. thick) are merely groups containing a greater or less number. The real plaques are designated by fine transverse lines on the fresh rods, seen only by an immersion objective, and very favourable illumination. Fracture is always determined by these lines at right angles to the axis of the rods.

Kühne had no sooner taken his first optogram than he proceeded to construct a theory of vision based on his observations. He thinks that

the light waves are transformed in the retina into chemical action by means of the purple which gives rise to different products for each colour. These products would, of course, affect the terminal nerve filaments each in its own manner. He believes that there may be other photo-chemical substances in the retina besides the purple. Even before the retinal red was discovered, however, Hering had called attention to some facts which seemed to indicate the existence of such a substance. The first of these facts is the phenomenon which he called *successive luminous induction*, and consists of the spontaneous formation of an areola of light around the negative image of a bright object. Another effect is seen when the line of separation between a white and a black surface is steadily regarded. At first both colours appear more intense (*simultaneous contrast*), but soon this effect disappears and after a moment each partakes of the colour of the other (*simultaneous induction*). From these facts he infers that the action of light is not limited to the retinal elements directly subjected to its rays. He was thence led to form a physico-chemical theory of vision, as the only probable one, and to suppose that the retina contained three different photo-chemical materials, which he chose to call the white-black, the yellow-blue, and the red-green substances. He thought that all the effects of light and shade, and colour might be produced by the assimilation or disassimilation of these three materials. He gave additional force to these suggestions by the remark that the hitherto received theory of retinal fatigue is disproved by the consideration that the negative image of a bright object on a dark background, developed in the closed eyes, never attains the blackness of the negative image of the same object developed on a lighter field.

But though these theories evidently point in the right direction, there are yet some facts which encourage the belief that the writing on the finger-board is not quite correct, as a guide to the road we must follow if we wish to find out the mystery of vision. Most birds, for example the pigeon and chicken, have no retinal colour. Minute red balls exist in the cones of the central, and yellow in those of the peripheral parts of their retinas; but although we exposed such retinas for an hour or more to the direct action of the sun's rays, the tint of the balls underwent apparently no change. The retinas of snakes and lizards consist entirely of cones and contain no red. Kühne was unable to find any retinal purple in man at the fovea centralis or macula lutea, and for 2 mm. around the latter the colour was very faint. The red disappears in front at from 3 to 4 mm. behind the ora serrata. At best, the rods only are coloured, the cones are colourless. Frogs, in which the retina has been bleached by exposure to sunlight, catch flies as well as ever. In such frogs the retina does not regain its colour for thirty minutes at least, but if during this time a fly commences to buzz around near them and alights anywhere within striking distance it is instantly snapped up. Coccia found that rabbits with bleached retinas saw perfectly well.

The writer has the temerity to suggest that perhaps, after all, the retinal red, as we find it, is only the excess of photo-chemical substance which in the intervals of active vision is stored up in the rods for future use. When the sight is being constantly exercised, no colour can be detected. Probably the only parts of the rods and cones capable of appreciating light are the extreme tips in contact with the pigment cells, where the retinal red is generated. The large flat ends of the rods would only be susceptible to large impressions as compared with the slender cone points. These last give us precision of detail just as we can more accurately measure a dis-

tance with compasses than with the fingers. In the eccentric parts of our retinas, where the rods much outnumber the cones, we get only general impressions of objects. But to obtain accurate definition of parts we must focus the rays on the crowded cone tips of the fovea centralis. The calculations of Volkmann showed that the smallest retinal image which could be perceived, irrespective of circles of dispersion was .0002'' in diameter; while, according to Schultz, the cone tips of the fovea are 4μ (.000148'') apart. Behind this region of distinct vision the pigment cells are more abundant than in any other part of the retina, and this insures a constant and ample supply of the visual photo-chemical substance just where it is most wanted, at the most used part of the retina. Why the red should be absorbed by the rods and not by the cones might possibly be accounted for by the broad absorbent surfaces which the former offer to the pigment cells; while the cones present an array of sharp points, more likely to repel than to attract.

It is after all not so certain that there is no retinal red at the macula lutea, for Schmidt-Rimpler reported nearly two years ago that in *perfectly fresh* human eyes, taken either from the body immediately after death or removed during life, he found the macula lutea of a dark reddish-brown colour. This spot of colour gradually grows smaller, the well-known yellowish hue taking its place. The yellow tint first forms a zone surrounding the decreasing reddish-brown spot, and encroaches on the space occupied by the latter as it contracts, so that the last speck of red is to be seen at the centre of the fovea. This red colour of the macula does not depend upon the choroidal vessels showing through, for the retina is no thinner here than elsewhere, indeed, according to Schultz, it is thicker. Besides the colour goes with the retina when it is pushed about over the choroid. Even the exceptional cases of birds and reptiles, which have no retinal red but only coloured globules in the rods and cones, become less exceptional in the light of the investigations of Capranica. He found these globules, which are of various shades, from ruby-red, through orange and yellow, to colourless, to exhibit three characteristic reactions. 1. Sulphuric acid turns them dark violet, changing to dark blue. 2. Nitric acid turns them greenish-blue, quickly becoming colourless. 3. A 0.25 per cent. solution of iodine turns them bright green, passing to greenish-blue. The coloured globules in the pigment layer of the frog's retina exhibit the same behaviour to these reagents. This leads Capranica to suppose that the only difference existing among these globules arises from the various degrees of concentration of the colouring matter. All the globules are soluble in ethylic, amylic, or methylic alcohols, in ether, chloroform, benzine, and sulphuret of carbon. These solutions are yellow, except the last, which is red. The spectroscope gives an absorption band at the line F and another between F and G. Light has more or less effect in decolorizing the solutions. Now all these tests are the same in result as those relied upon to distinguish the substance which Hoppe-Seyler and Thudicum have described under the name of *luteine*, and which is found in the yolk of eggs, in the yellow bodies of the ovaries, serum of blood, etc. It appears to stand in a parental relation to the Erythropsine of Boll, and suggests the thought that even before the eye is created the substance upon which vision depends is already in existence.

H. S. S.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XX.—*Saint Bartholomew's Hospital Reports*. Edited by W. O. CHURCH, M.D., and ALFRED WILLETT, F.R.C.S. Vol. XIII. 8vo. pp. xxiv., 354, 126. London: Smith, Elder & Co., 1877.

FROM 1865, the date of issue of the first number of this excellent series, up to the present time, each year has witnessed the publication of a volume, fairly and adequately representing the vast experience gathered by the medical staff or former pupils, within the walls of the venerable St. Bartholomew's. Vol. XIII. ably sustains the reputation earned by preceding numbers; it contains twenty-eight papers, of which some are purely surgical while others are more particularly interesting to physicians. We will consider the medical papers first.

In the first article, on *Præsysolic Murmurs at the Heart's Apex*, by Dr. JAMES ANDREWS, the author, though holding that all cardiac murmurs produced at the auriculo-ventricular openings must be either systolic or diastolic, that is, the current either passing into or out of the ventricles, retains the term "præsysolic," as sanctioned by long use; restricting it, however, to a murmur occurring during the last part of the ventricular systole. The characters which he gives to such a murmur are—

"That its point of greatest intensity is a little within and above the apex beat; it fades towards the left axilla, and is not heard behind. A diastolic thrill is present over the left ventricle. The murmur has a peculiar, harsh, droning sound, and becomes louder towards its close, which is abrupt. It is generally difficult to distinguish an interval between it and the first sound. The first sound is shortened and intensified. Reduplication of the first sound is of frequent occurrence. The second sound is very feeble, or entirely absent at the apex; the second sound is intensified at the left base, and very frequently reduplicated. The physical signs of dilatation of the left auricle and of the right side of the heart are present. The murmur varies much in loudness, length, and pitch; may disappear entirely or even be replaced by a systolic apex murmur. These changes are of common occurrence as the case approaches its termination. The pulse is often small, rapid, and very irregular."

These symptoms Dr. Andrews believes to be equally characteristic of mitral stenosis and mitral roughening. The fact that in some cases of præsysolic murmur the second sound is very feeble, or even entirely absent at the apex, though heard at the base, is advanced by the author in support of the fanciful theory originally proposed by Gendrin, which attributes the second sound of the heart to "the sudden entry of blood into the ventricle during its diastole," a position in which we are inclined to think he will find few supporters.

The second paper, by Dr. J. WICKHAM LEGG, *On the Essential Phenomena of Jaundice*, is the continuation of the series commenced in the last volume of these Reports by the author, and exhibits his extended knowledge with the bibliography of the subject, the major part of his article being the statement of the views of others. According to Dr. Legg, the coloration may appear, usually first in the conjunctiva, within twenty-four hours after obstruction, though even then the urine will give a good reaction with Gmelin's test. The other mucous membranes, except the part under the tongue, as first noticed by Hippocrates,

do not exhibit the yellow colour, though they can be made to look jaundiced by pressing away the blood, and allowing the colour of the tissues beneath to show through. The secretions, with the exception of the urine, as stated by the author, rarely show the presence of bile pigment, though the assertion hardly appears sustained by the number of instances he has reported in which the pigment was found by various observers in the different secretions, more particularly in the sweat. He has also noticed that croupous exudations contain bile pigment more frequently than catarrhal, while the serous exudations first show its presence. Dr. Legg does not agree with Frerichs as regards the frequency with which jaundice is accompanied by constipation, and states that he has most often found diarrhoea in simple acute jaundice, by which, probably, he refers to catarrh of the bile-ducts, in which case it would be natural to expect diarrhoea from the common participation of the intestines in the catarrh, while in the chronic cases, when the intestinal catarrh has subsided, we would expect constipation, from absence of bile, the natural cathartic, a condition which agrees both with Dr. Legg's experience and Frerich's statement as to constipation being the rule. Albumen is rarely absent, and sugar rarely present in the urine. The analyses which Dr. Legg has made of the urine of ten cases of jaundice have not thrown much light on the vexed question of the relative proportions of urea in the healthy and jaundiced urine; his observations simply show that in jaundice the urea may be reduced, natural, or greatly in excess.

In an article entitled *Brief Notes on the Outbreak of Scurvy in the late Arctic Expedition*, Mr. HARRY LEACH has contributed a well-written abstract of the evidence given before the "Arctic Committee" appointed by the Admiralty to investigate the circumstances attending the disastrous outbreak of scurvy alluded to in the title. Every one, we think, will acknowledge that scurvy is a disease which should never, in these days, be seen in any civilized community, except in times of war or famine, and that it should occur in an expedition absent, from start to return, only a little over one year, and supplied without stint with everything that science or art could direct,—that scurvy should appear under such circumstances, is naturally calculated to awaken suspicions of ignorance or neglect on the part of either the medical or executive officers. Let us see what bearing the facts detailed by Mr. Leach would exert upon this impression. The expedition, consisting of a complement of 122 men for the two vessels, the *Alert* and the *Discovery*, started in the summer of 1875; the winter was spent to a great extent in darkness, the sun not being seen from the *Alert* for 142 days, and from the *Discovery* for 138. The breathing space allotted to the men on the *Alert* was 107, and on the *Discovery* 140 cubic feet; various analyses of the atmosphere between decks on the *Alert* showed a proportion of 0.3314 per cent. of carbonic acid, or more than *five* times the maximum amount in a sufficiently pure air, and on the *Discovery* 0.415 per cent. or nearly *seven* times as much as the maximum quantity. It is also stated that a great amount of dampness constantly prevailed between decks, and that there was a deficient supply of fresh meat, the men on the *Alert* having rations of it on only 53 days, and on the *Discovery* only 14 days. No case of *scurvy*, however, is reported as having occurred during the winter, except in one instance, a hard drinker, and the conclusion is therefore drawn by the author that the men were in *good health* at the end of this period, a conclusion unwarranted by the facts of the case. For several weeks previous to the departure of the sledging parties, lime-juice was served out to the men in double quantities. The sledge diet contained an excess of 8.21 ounces of water-free solids over the ship diet, the excess being largely made up by an increase in the quantity of fat. In the *ship diet*, vegetables were represented by preserved potatoes, issued in rations of eight ounces once or twice a week, and of four ounces

four times a week; other compressed vegetables in rations of two and six ounces respectively twice a week, while vegetables were present in several of the tinned meats. There was, besides, a daily ration of *one* ounce of lime-juice (all authorities agree that less than *four* ounces has no antiscorbutic value), increased on board the *Alert* to two ounces during March. In the *sledge* scale of rations *vegetables are represented by only two ounces of preserved potatoes, while in no instance was lime-juice systematically given.*

“Such were the dietary conditions under which the sledge expeditions were organized, and 58 cases of scurvy out of the 60 occurred in men who had been deprived for a greater or less period of adequate vegetable material in their food. Practically they had lived without vegetables, or its substitute, lime-juice. Some of this juice was indeed carried by two or three of the minor sledge parties, especially by those which started from the ships towards the latter part of the sledging season, or visited the depot where lime-juice was stored. But, as we know, *it was not given systematically in any case, and the sledge parties which suffered most severely from scurvy were not provided with it.*” (*Italics are ours.*)

Under such circumstances it is not surprising that scurvy should have appeared. No one, probably, now-a-days will question the fact as to the deprivation of fresh vegetable food being the invariable antecedent of scurvy, while the position of lime-juice as an anti-scorbutic is equally assured. And yet we have here the statement of a reduction in vegetable food and the cessation of the administration of lime-juice—the actual deliberate creation of the cause and removal of the antidote of a disease under circumstances in which all former experience had shown its appearance most to be expected and dreaded.

Instead, however, of finding resolutions of censure, certainly merited, by those who had the responsibility of organizing this expedition, we find the tame and puerile conclusion, “arrived at by the Committee and indorsed by the Admiralty, was, that ‘the early outbreak of scurvy in the spring sledging parties of the expedition was due to the absence of lime-juice from the sledge dietaries’” (p. 47), and “it was agreed, however, and with some show of reason, that lime-juice cannot be carried in sledging expeditions so as to be given systematically, according to the scale above mentioned” (p. 46), and that, too, in the face of the statement made on p. 44, that, in the sledging parties “in the cases of the ‘*North Star*,’ ‘*Pioneer*,’ and ‘*Intrepid*,’ the medical evidence goes to prove that the immunity from scurvy was due to the *regular serving out of lime-juice, with frequent rations of fresh meat and vegetables.*” (*Italics ours.*) It is also stated on the same page that “there is good reason to believe that, with some few exceptions, the disease appeared in a greater or less degree, *i. e.* where no anti-scorbutics were carried and taken systematically.” In this connection, it is interesting to note that Mr. Leach quotes from a Blue Book published under the auspices of the Board of Trade only two years ago (Parl. Paper. 117, 1876), in which the outbreak of scurvy in several instances in the merchant marine is attributed to the *eating of “scouse,” i. e., a mixture of cook’s fat, biscuit, and water, to which minced salt meat is usually added.* We think, however, with Mr. Leach, that it would be difficult to prove that any of these articles were either directly or indirectly scorbutic in their effects, nor do we think it likely that this “Official Report” will have any marked influence on the views long held as to the causation of scurvy. It is also to be noticed that as contributions (?) to our knowledge of the prophylaxis of scurvy, the Admiralty recommend the “carrying of eggs,” “fresh meat, or, as its best substitute, preserved meat;” “vegetables rank highest in anti-scorbutic value,” while rum is acknowledged inferior to tea, and some concentration of lime-juice, such as lozenges, is recommended as more portable. These are the outlines of the abstract made by Mr. Leach of this Blue Book, which he thinks “undoubtedly furnishes the most complete scientific, as well as

practical, essay on scurvy that exists at the present time." Accepting Mr. Leach's abstract as correct, we cannot but consider the expedition as a disastrous failure in every respect, and the Report a discredit to English literature.

The next article is by Dr. W. HENRY KESTEVEN, and is entitled *Further Researches on the Pathology of the Nervous System*. In a paper published in the last volume of these Reports the author described the degenerative changes met with in disease of the cerebro-spinal nervous system; the present paper is concerned with the atrophic changes found in the nerve cells, nerve fibres and neuroglia, and alterations in the bloodvessels. In commencing atrophy of the *nerve cells* the first change the author noticed was the appearance between these bodies and the neuroglia of a gradually increasing space, accompanied by degeneration of the nucleus, whose apparent increase of size he states is due to the wasting of the corpuscle. In a later stage, the corpuscular processes shrink and finally disappear through loss of their axis cylinders, or they may remain as simple fibres. The final stages resemble pigmentary degeneration and are usually associated with vascular disturbances. Atrophy of *nerve fibre* is usually associated with sclerosis of the neuroglia, so that upon cross section, instead of showing its regular spiral arrangement, the axis cylinders may appear crumpled or even entirely disappear, leaving a round or oval hole which may ultimately be filled up by hypertrophied neuroglia, increased at the expense of the nerve structure proper. In some cases of general nervous atrophy, as from external pressure, there may be a decrease of all the nerve elements. Atrophy of the *neuroglia* is always associated with atrophy of the other nervous elements, and is characterized by disappearance of or excessive decrease of the normal number of its nuclei. Among the alterations in the *bloodvessels*, Dr. Kesteven alludes to aneurisms in nervous tissue, and the cause of formation of the perivascular spaces. The former, according to the author, are most frequently seen on the convex surfaces of the loops at the margin of the spinal cord and at the lower part of the anterior fissure. The perivascular spaces, Dr. Kesteven believes, when found in nervous tissue, to be of morbid creation, caused through atrophy of the nerve elements from pressure by distended vessels, the post-mortem emptying and contraction of which leave spaces surrounding them. While possibly these views may be correct, though in direct contradiction of the statement of His, and though they appear to be substantiated by the fact that Key and Retzius were unable to inject them either from the bloodvessels or lymphatics, the observations of Kölliker, Virchow, Von Recklinghausen, Arnold, and Foa have demonstrated the existence of perivascular serous channels in other structures, though even this fact has been questioned by Tarchanoff, and it seems possible that future experiments may show the presence of perivascular serous channels in the nervous system. The paper is illustrated by six excellent lithographs.

Dr. KESTEVEN has also contributed another paper on *The Structure and Functions of the Olfactory Bodies*. Several points in this article are worthy of notice. In the first place, after describing the well-known coarse appearance of these bodies, *i. e.*, the *inferior* olives, we find him repeating the statement originally made by Lenhossek and Schröder v. d. Kolk, but since disproved by Clarke, Fry, Meynert, etc., of the connection of the inferior olives with the fibres of the hypoglossal nerve, a connection on which he bases part of his theory of function. On the other hand it appears from the description that the fibres which Dr. Kesteven considers as *commissural* between the *nerve cells* of the two olives, really belong to the *outermost* and *middle fibræ arcuatae* described by Meynert, which pass from the restiform body through the nucleus of the 5th nerve, in part through and in part behind the olivary body of the same side, *without however any connection with its nerve cells*, and out of its hilus and into the hilus of the

olivary body on the opposite side *with whose cells it does connect*. The external white cortex of the olivary body, according to the author, consists of two layers of fibres derived from the cells of the gray matter of these bodies: the *external* layer is derived from the internal corpuscles of the convolutions, some of whose processes converge and pass out of the hilus: of these, some pass down the medulla, diverging, after winding around the superior margin of the olive, thus agreeing with the course of the fibres of the *stratum limnisci* which Burdach has described as the *funicle olive*: others of these fibres, which the author states pass downwards and inwards, are evidently that portion of the *fibræ arcuatae* which Stilling, Lenhossek, Schröder, Clarke, and more especially Deiters, have described as the *anterior division* by which the inferior olives are connected with the restiform bodies on the opposite side, thus forming part of the same system to which the fasciculi cuneatus and gracilis and posterior *fibræ arcuatae* belong. The *internal layer* of the cortex, Dr. Kesteven states is formed by fibres from the external corpuscles of the convolutions, the fibres passing from before backwards in a direction at right angles to that of the external layer, thus agreeing with the fibres which Meynert has described as the most posterior of the *fibræ arcuatae*. On the strength of the communication which the author states to exist between these bodies and the 5th, 8th, and 9th nerves, he considers that the olivary bodies are the co-ordinating centres for the movements of deglutition.

The three following medical papers are by Dr. SAMUEL GEE. In the first of these Dr. Gee calls attention to the possible causation of *Pneumonia by Disease of the Tracheal and Bronchial Glands*, and details four cases in which such disease was followed by perforation or compression of the adjoining bronchus with subsequent gangrenous or ulcerative pneumonia.

In the next article Dr. Gee describes as *Spastic Paraplegia* a disease "characterized by constant rigidity of the legs, or of the legs and arms, which increases when the limbs are handled, and disappears under the use of chloroform." Among other attributes, he states that the lesion is congenital, or occurs in early infancy; the affected muscles are well nourished and respond to faradism. No tremors; intellect and sensation normal; no lesion of micturition; general nutrition good; back weak in all cases; chorea in two cases of the four he reports, convulsions in two, painful cramp of the legs in one case. Dr. Gee, also, in a *Contribution to the History of Polydipsia*, narrates the rather curious instance of eleven patients, all members of the same family, and representing four generations, being afflicted with *diabetes insipidus*. In two instances the disease was congenital; in several cases members of one generation, who had escaped the family disorder, transmitted it to their children; two cases are reported as having outgrown their disorder.

The next medical paper is a well-written essay on *Fibrinous Exudation into the Bronchial Tubes*, by Dr. F. DE HAVILAND HALL, with full notes of one case. Under the title of *Cases bearing on Diseases of the Liver*, Dr. J. WICKHAM LEGG has reported two cases of cirrhosis occurring in children, in neither of which any symptoms occurred to direct attention to the liver before death. The symptoms in one case, a boy aged 12, closely resembling typhoid fever or tuberculosis; while the other, an infant aged 17 months, showed, with the addition of purging, symptoms only of tuberculous meningitis. Post-mortem examination in both cases showed cirrhosis; the bibliography is given of cases of cirrhosis in children. In alluding to the so-called "Movable or Displaced Liver," the author mentions a case in which all the symptoms described as being present in cases of displaced liver, such as the absence of the normal hepatic dulness and the presence of a tumour, resembling the liver, in some other situations, were present in a case under his charge, which post-mortem examination revealed to be a case of tumour

of the right kidney, the liver being in its normal situation, and even increased in size. From the fact that tympanitic bowels or emphysematous lungs may conceal the hepatic dulness, while many abdominal tumours might resemble the liver in physical characteristics, and from the fact that none of the reported cases were confirmed by autopsy, one being disproved, the author thinks that in view of the improbability of sufficient relaxation of the hepatic ligaments, a movable liver is an anomaly whose existence remains still to be proved. He also reports a case of supposed primary melanotic cancer of the liver.

The next paper is entitled *Medical Cases*, by SAMUEL WEST, M.B., and contains the history of three cases of fever with diarrhœa; in two of which ulcerations were found in the large intestines; in one there was an abscess of the liver. The clinical histories strongly resemble typhoid fever, from which, however, they are separated by the absence of the characteristic eruption and post-mortem lesions; Mr. West also states that the ulcerations did not resemble those of dysentery. Two cases of pneumothorax from tubercular phthisis are reported, and two cases of anæmia in which the microscopic appearances of the blood resembled those of pernicious anæmia. One case recovered. The same author next describes a case of *Hypertrophic Cirrhosis*, occurring in a child 3 years old, traceable to a severe scald and characterized by chronic icterus with exacerbations, attended by hepatalgia, fever, enlargement of liver, and gradually increasing icterus. Persistent enlargement of liver, no ascites, no dilatation of abdominal veins, death, with symptoms of "icterus gravis." Post-mortem examination showed the case to be one of "hypertrophic cirrhosis," with its characteristic development of new bile-ducts. The report is illustrated with a plate.

Dr. DYCE DUCKWORTH contributes a paper on *The Etiology of Mitral Stenosis*, with deductions from 264 cases, 80 of which are tabulated, the main points of which are that he found a rheumatic origin in 60 per cent.; females are affected more often than males; the average age of all cases being about 30 years, while the mitral valve is sometimes affected in children in the course of the exanthemata.

Mr. P. KIDD contributes an interesting case of *Great Enlargement of Pons, Crura Cerebri, and Medulla*, and Mr. JOHN ABERCROMBIE, *A Case of Spasmodic Rigidity with Idiocy*. The last article in the volume is an extremely elaborate paper by Dr. LAUDER BRUNTON and Mr. D'ARCY POWER on *The Albuminous Substances which occur in the Urine in Albuminuria*. No abstract that we could make would give any adequate idea of the contents of this contribution, and we regret that we have not space to notice it at length.

This number contains also the Proceedings of the Abernethian Society, and terminates with the Statistical Report of the Hospital Cases for 1877, compiled by the Registrars, and occupying 127 pages. R. M. S.

We shall next notice the surgical papers in their order.

Mr. FRANCIS HENRY CHAMPNEYS presents an account of a dissection of a *Case of Extroversion of the Bladder in a Female Child*. It is a model description; full, but not diffuse, concise, yet not obscure. After a description of the dissection, and a sufficient comparison with a number of other similar cases, he discusses the theories of the causation of such defects, grouped under three heads: 1. Mechanical; 2. Pathological; 3. Developmental. He concludes, as seems most probable, that it is due to an arrest of development, and dates from before the third week of intra-uterine life. A very useful partial bibliography is appended; a growing custom we most heartily commend.

The same author next relates a *Case of Interstitial Fibro-myoma of the Uterus*, which complicated delivery. No symptom of its presence previous to the sixth

month of pregnancy had ever been observed. Natural labour being impossible, turning was resorted to, and after the use of much force a dead fœtus, weighing 5½ pounds, was extracted. A few days after delivery, an offensive discharge and constitutional septic symptoms set in, the temperature rising to 102°, for which carbolized injections, ergot, and quinia were used. The tumour gradually subsided, five weeks after delivery it was found projecting at the vulva, and was removed. The mass was as large as the fist. Her symptoms at once improved, and about three weeks later she left the hospital. A brief, but instructive discussion of similar cases follows.

As *Intolerance of Light* is almost as universal a symptom of diseases and injuries of the eye as lameness is of diseases and injuries of the leg, the title of Mr. B. J. VERNON'S paper might afford free scope for quite an extended treatise. The author has, however, confined himself principally to phlyctenular keratitis, sympathetic ophthalmia, and hysterical asthenopia.

The paper would have done very well as a lecture to medical students, but, as it contains no original observations and no suggestions in pathology or therapeutics that may not be found in the text-books of ophthalmic surgery, it is not very clear why the author felt impelled to contribute it to the reports.

Mr. HENRY J. BUTLIN'S paper is on *Fatty Tumours in Infancy and Childhood*. On account of their great rarity the two cases which he records, the only two in four and a half years in the large number of patients at St. Bartholomew's, are valuable, although in themselves they were not remarkable. One in a child of twelve years lay over the left sterno-mastoid muscle, and was said to have appeared at nine years of age. It was first believed to be glandular. The other patient was seven years old. The tumour was situated in the calf, and had been first noticed a year after birth. It was removed with difficulty, as it extended between the bones to the front of the leg. The operation was followed by pyæmia, but after amputation of the thigh the child recovered. Most of these tumours are encapsulated, and contain a larger proportion of fibrous tissue than similar lipomata in adults. Several similar cases are briefly quoted.

Mr. E. L. HUSSEY next gives a case of *Aneurism in the Gluteal Region after a Punctured Wound*. An intemperate man, æt. 53, was struck by his wife with a short, broad dagger in the gluteal region. Copious bleeding followed, but ceased spontaneously, and he went to his work the next day. The wound soon healed, but three or four weeks afterwards, on rising from his chair, he felt a pain at the part, and found a small swelling. Two months later, it was as large as a small orange; six weeks later still, it was three times as large, and he was compelled to give up work and submit to treatment. An aortic clamp was applied, and by an incision eight inches long, from the anterior crest of the ilium towards the middle of the sacrum, the aneurism was laid open, and by two fingers the bleeding was controlled. The tourniquet had slipped from its place as the man lay on his right side, and about a pound and a half of blood were lost. The slit in the artery was soon discovered, and a ligature applied on each side of it. From the sixth to the fifteenth day secondary hemorrhage occurred some six times, but was always controlled by ligature or pressure. He died on the sixteenth day from exhaustion. On examination, it was found that the wounded artery was the large descending branch of the gluteal. The procedure advocated by Mr. Syme was the only one practicable in this case, though it seems to have been followed not intentionally, but because the sac was accidentally opened.

The treatment of the pedicle in cases of ovariectomy seems never to lose its interest, although its discussion has been carried to the nth power, and accordingly Mr. ALBAN DORAN writes on *Complete Intra-peritoneal Ligature of the Pedicle*. After relating a few recorded cases, in several of which this method

was adopted (the credit of which he gives appropriately to Dr. Nathan Smith, of Connecticut, in 1821), he narrates briefly the post-mortem results in two cases operated on by Dr. Bantock, one of which ended fatally on the sixth day, and the other (from sarcoma) after seven months. The point he makes, and it is well taken, is, that the distal end of the pedicle is saved from gangrene by adhesions contracted with the broad ligament, through which adhesions it is nourished. The ligature in the first case was silk, in the second hemp, and the latter had been completely absorbed.

By far the most interesting surgical papers in this volume are the next two. The first is by Mr. LUTHER HOLDEN on a case of *Aneurism of the Right Subclavian for which Amputation was performed at the Shoulder-Joint*. Professor Spence in 1864 (*Med. Chir. Trans.*, lii. 396) did the first operation of this character. His patient lived for four years, but the aneurism though diminished was not cured. This, the second operation, was done on a patient, æt. 44, whose aneurism extended beneath the sterno-mastoid, the trapezius, and the clavicle, and had caused wasting of the arm and severe neuralgia. The aneurism dated from great exertion in lifting a heavy weight two years before, when he felt sudden pain, followed in a few weeks by a swelling over the collar-bone. As proximal ligature offered no hope of success, the effect of cold was first tried. Ice was "applied in a bag" *uninterruptedly for nineteen weeks*, the patient meanwhile being on half diet. It would have been better had the method been more accurately stated. The effects of dry cold (by ice in a rubber bag), and of wet cold are so very different as to comfort, convenience, efficiency, and often as to the ability of a patient to bear it, that this should not have been left to conjecture. Moreover we cannot but think it an error to continue this mode of treatment so long. A shorter time would have sufficed to show its value or its inefficiency, and as at the end of the four and a half months it is said that towards the clavicle the aneurism was "more thinned by absorption" and the patient was "decidedly weaker," we cannot but think that persistence was disastrous. Next for twenty-one days three pounds of small shot in a bag were applied continuously, and the diet further restricted to 4 oz. each of bread and meat, and 5 oz. each of milk and water per diem, but without result. Then for three days simultaneous compression of the carotid and brachial arteries was employed for eight, ten, and eight hours respectively, chloroform being given for the last five hours. The compression produced no effect on the aneurism, but induced very great, and for a time alarming, depression. Compression on the carotid sufficient to arrest the pulsation produced syncope. The late Prof. Dickson more than once has shown the writer the effect of compression of one carotid, which would cause a loss of over twenty beats, an effect, however, which many experiments have shown not to be true of all persons. Eighteen days of full diet restored the patient's strength, and as the aneurism had greatly increased and threatened a speedy and fatal rupture it was determined to amputate at the shoulder-joint. The axillary artery was first tied through the pectoral muscles, and the operation then completed "in the usual way"—presumably by the deltoid flap. Pulsation was at once diminished. On the fifth day the carbolized oil dressing was abandoned because it produced sooty urine. Excepting a slight pneumonia on the fourteenth day, he did well till the twenty-fourth day, when the ligature came away. At this time the aneurism became enlarged and tender, the skin inflamed and sloughed, discharged offensive watery fluid, and on the thirty-seventh day he died from exhaustion.

The *post-mortem* showed an axillary abscess, erosion of the clavicle, and an aneurism of the second and third parts of the subclavian and first part of the axillary, and a wide slit across the upper surface of the artery near its commencement. That the slough was due to the impaired vitality from the too long-continued use

of ice and pressure seems not doubtful, and a much earlier resort to amputation would be justifiable in any similar case.

The other very interesting paper is by Mr. W. MORRANT BAKER, on *The Formation of Synovial Cysts in the Leg in connection with Disease of the Knee-Joint*. He relates eight most instructive cases which should be carefully read, and deduces the following important practical conclusions.

"1. In cases of effusions into the knee-joint and especially in those in which the primary disease is osteo-arthritis, the fluid secreted may make its way out of the joint, and form, by distension of neighbouring parts, a synovial cyst of large and small size. [The route by which it escapes he thinks is doubtful, but it may be by the normal bursæ of the popliteus, or the semi-membranosus, or by a hernia of the synovial membrane.]

"2. The synovial cyst so produced may occupy (a) the popliteal space and upper part of the calf of the leg, or may (b) be evident in the calf of the leg only, projecting most, as a rule, in the inner aspect of the leg, or (c) may be perceptible only at the upper and inner part of the leg as a small defined swelling, not approaching within three or four inches of any part of the knee-joint.

"3. However large the synovial cyst may be, fluctuation may not be communicable from it to the interior of the knee-joint; but the absence of such fluctuation must not be taken to contra-indicate the existence of a connection between the joint and the cyst.

"4. The synovial cyst may be expected to disappear after a longer or shorter period without leaving traces of its existence even on dissection of the limb.

"5. The cyst should not be punctured [he does not discuss aspiration, which might with great propriety be tried], or otherwise be subjected to operation, unless there appear strong reasons for so doing; inasmuch as interference may lead to acute inflammation and suppuration of the knee-joint.

"6. Most often the disease in the knee-joint will be found to have begun some time before the appearance of the secondary synovial cyst; but sometimes the patient's attention may be first drawn to the latter, or the cyst may seem for a long period the more important part of the disease."

Curiously enough his drawing of Case II. represents a cyst on the inside of the left knee, while the text describes it as on the right.

Mr. FRED. S. EVE gives the history of a *Case of Fractures through the Base of the Odontoid Process*, from a blow on the head. The atlas and odontoid were dislocated anteriorly compressing the cord, yet the patient survived the accident for two and a half hours. He adds eleven other cases (excluding those from shot wounds), and analyzes briefly but clearly the symptoms. He recommends cautious traction on the head with a slight inclination backwards and immobilization without a pillow, by sand bags with a pad under the neck, or by a splint (by far the preferable plan).

Dr. S. D. DARBYSHIRE, narrates a *Case of Perforating Ulcer of the Sclerotic*, in which there were three ulcers, one of which exposed the choroid. They all healed after abscission of the other (left) eye for destruction of the cornea.

W. W. K.

ART. XXI.—*Transactions of the Obstetrical Society of London*. Vol. XIX. For the year 1877. 8vo. pp. 279. London: Longmans, Green & Co., 1878.

WITH an increasing fellowship, now numbering over 700, the printed records of this Society appear to be gradually growing less, although there are evidences of much activity among the real workers. The fact is, that the publications of a medical society are not always the best evidences of the grade of interest that is

manifested at its meetings. After some years of existence, there is little disposition in a medical body to repeat its own work, except where cases are rare, peculiar, remarkable for success, or give evidences of originality, either in the method of operating, or mode of medical treatment. We know by experience that much of value in medical discussions, to those in attendance, is necessarily lost to the reader, for whom but a very condensed record can be prepared by the secretary.

The volume opens with the *Report of the Delegate to the Philadelphia Medical Congress*, which is quite a flattering and pleasant notice of our International Medical Congress, held at Philadelphia in 1876, by the Society's delegate, Dr. ROBERT BARNES, who was elected chairman of the Obstetrical Section. Dr. Barnes says :—

“As to the business itself, it is difficult to express the satisfaction and instruction I derived from the memoirs read, the able and earnest discussion, and the deep interest which kept the largest audiences I have ever seen at similar meetings together from the beginning to the end of the proceedings. There were rarely less than three hundred delegates, members, and visitors present. No social attractions—and these were many and tempting—ever prevailed over the earnest devotion to professional work, which had drawn by far the greater proportion of the medical men who had thronged to Philadelphia from every part of the United States and Canada.

“It would scarcely be becoming to dwell here upon the many acts of kindness which met me at every step. The warmth of American hospitality is too well known to require to be told by me. The general impression remaining upon my mind is one of doubt as to which country I more especially belong to. It is very true that science binds her votaries into one community; but it is also very pleasant to feel that this communion receives a new charm from the tie of personal friendship and kindred sympathy.”

Mr. A. D. L. NAPIER, of Fraserburgh, N. B., reports a *Case of Trismus Nascentium* in an infant five days old; parents healthy; hygienic condition good; funis separated the day before, and cicatrix quite healthy; labour easy and natural. Child died in 23 hours; treated by leeching, and bromide and iodide of potassium. There was no autopsy. The case is remarkable as an instance in private practice in which all of the causes to which this disease is ascribed were entirely wanting.

Three Cases of Pyæmia in New-born Infants are reported by Dr. GEORGE ROPER and Dr. ARTHUR W. EDIS. The first was healthy at birth; cord separated on fifth day; skin around umbilicus a little red. In three or four days swelling became soft, and extended upwards over right clavicle and shoulder; fluctuated; was lanced, and discharged healthy pus. Child took nourishment; bowels were opened, but became weaker; breathed with difficulty; abdomen began to distend, and it died when nineteen days old.

Abscess in arm circumscribed, and involving only subcutaneous connective tissue. No pleurisy or heart disease. Peritoneum reddened and injected, but no lymph on surface except over liver. Umbilical vein full of pus, but no thrombus; phlebitis extended along portal vein for some distance into the liver. Hepatic vein and vena cava healthy; abdominal swelling due to distended stomach.

Physician in attendance assisted in delivering a primipara with forceps two days before its death, and cut and tied the cord. Child died in same way on fourteenth day. No injury to either mother or child. Mother died of same disease in two months, swellings having occurred in both shoulders, elbows, knees, and ankles, and in the toes. She had no metritis, peritonitis, or tympanites.

The third was a male child of 4 lbs. 10 oz., believed to be eight months. Labour easy; seventh confinement; husband consumptive; two preceding children still-born. Child blue and feeble, but nursed slightly; died on eighth day. *Post-mortem*.—Tissues around umbilicus much inflamed; purulent deposits in vessels, but not in liver; whole of right thigh infiltrated with serous fluid; pus extending between sheaths of muscles; femoral vein plugged, and tissues sloughing generally; abscess on region of right shoulder posteriorly; slight traces of localized peritonitis.

The Annual Address of the President, Dr. PRIESTLEY, is mainly a *résumé* of the work of the Society for the year, with comments of his own upon some special points. He rates the mortality after removal of fibroid tumours of the uterus by surgical proceedings, at two-thirds of the cases. His remarks upon the frequent use of the forceps in modern obstetric practice are made at some length, and he deprecates the tendency to indiscriminate instrumental interference, and points out the danger of recommending a general early resort to forced delivery, because of the want of proper skill and carefulness in a large proportion of obstetric practitioners, who require restraint to prevent them at times from hasty delivery in order to attend to other calls.

Dr. Priestley is also evidently not in favour of the Cæsarean operation in cases of cancer of the cervix, except where the disease is very far advanced, and involves adjacent structures. In this opinion he differs from some of his colleagues, who believe in a very general resort to the operation in parturition, where the os is decidedly cancerous, believing it to be the best plan of delivery. The operation has never, we believe, been performed in the United States for cancer, but it has been several times in England, and the results have been more favourable than in any other class of subjects.

Dr. Priestley also condemns the growing disposition to early surgical interference with tubal and abdominal pregnancies, and the evacuating of hæmatoceles. He closes his address with the usual notices of deceased fellows, paying a handsome tribute to the late Walter Channing, of Boston, and Gustav Simon, of Heidelberg.

Mr. FRANCIS ELLINGTON, of Ontario, reports a case of *Spontaneous Inversion of the Uterus* in a multipara on the second day after delivery, from the effects of a large dose of castor oil, given contrary to directions, by the nurse; the uterus was readily replaced, and the patient soon recovered.

Three Cases of Inversion of the Uterus, under Dr. Greenhalgh, are reported by Dr. CLEMENT GODSON. 1. Woman 21, primipara, inversion of five months' standing; various attempts at replacement by Drs. Greenhalgh and Godson during two months, failed; amputation of uterus with *écraseur* by Dr. Godson; patient made a good recovery. 2. Woman 31; three miscarriages and one child. Inversion of two years and a half standing. Four attempts at replacement during three months, but all failed. Uterus removed in same way by Dr. Greenhalgh. Woman up on fourteenth day, and well on 22d. 3. Woman 28, single, one child. Inversion of same duration as in No. 2; numerous attempts, under most approved methods of replacement, failed; uterus removed as in other cases, and patient recovered without a bad symptom.

Case of Inversion of the Uterus, Replaced; by Dr. HEYWOOD SMITH. Woman primipara, æt. 30; inversion of three months' duration. Pressure on fundus failing, it was transferred to right cornu, which was gradually indented, and the organ replaced in fifty minutes. Dr. Smith claims an improvement over the method of Noeggerath, of New York, in that he did not first re-invert the neck, as recommended by him.

In the discussion that ensued upon these reports, Dr. Horatio Storer, of Boston,

took strong ground against the operation of removal of the uterus, and advocated the method of slow replacement, as practised in some cases of very long standing with success, by American gynecologists.

The Forceps in Modern Midwifery, is the title of an article by Dr. ARTHUR W. EDIS, who is an advocate of the long double curved instrument; believes in the oscillatory mode of traction; prefers craniotomy where the fœtus is dead, and its head firmly impacted; credits the instrument with saving life in many instances of protracted feeble labour; and claims an advantage in its use as often as one in ten cases.

The discussion showed a great diversity of opinion, based on general statistics and private experience, according to the special habit of the advocates of frequent or rare use, as the case might be. There is a great fear on the part of many obstetricians, as evinced by the discussions that have so frequently taken place in medical societies upon this subject during the last few years, lest the recommendation of a more frequent resort to the forceps, by the favorable statistics of some advocates, should work evil, rather than good, at the hands of meddlesome and unskilful men. In a private practice of two or three thousand cases in a series of years, much will depend upon the skill and care of the physician, and a great deal also upon the class of subjects he has had to treat. If he has had no cases of syphilis, ruptured uterus, or deformity of pelvis, he may have had marked success in saving mothers and children with a very seldom resort to the forceps. But reverse the character of his cases, and he will meet with losses whether he uses the instruments often or rarely. We met a practitioner recently, who, in a practice of three thousand cases among patients mainly in moderate circumstances, and many of them poor, had never met with a ruptured uterus, and had only been obliged to perform craniotomy once. Another party, whose practice was mainly among the higher walks of life, with a variety of experiences in deformities, craniotomies, cases of peritonitis, and uterine exhaustion, and who made very frequent use of the forceps, managed by carefulness and skill, under a fortunate train of circumstances, to pass through thirty years of his practice without losing a woman in labour, or from causes originating therein. Both of these men were very successful certainly, and from individual experience held opposite views on the question of the necessity for the frequent use of the forceps. The latter did not, however, advocate a general frequency of resort, because he felt that much depended upon the character of an obstetrician's practice, and his delicacy in handling the instruments. He had faith in his own skill, which he certainly possessed in a marked degree; but as a teacher of students, felt the necessity of caution in preaching what he practised.

This is the position now felt to be the correct one by many who do not hesitate to use forceps frequently, particularly in the lower pelvis, in feeble women, but believe it to be unsafe to recommend frequency as a general necessity to the profession at large. As all surgeons are not Randolphs in the use of the lithontriptor, so all accoucheurs are by no means Hodges, in handling and adjusting the forceps.

Dr. W. S. PLAYFAIR reports cases of *Fibroid Tumour Complicating Delivery*. Case 1. Mrs. W., æt. 34; uterine fibroid discovered in 1870, in 1872 it had grown so as to block up the pelvic cavity and seriously interfere with urination, to relieve which, the mass was pushed up out of the pelvis by introducing the whole hand into the vagina. In 1873 she married, much against the advice of her physician, and soon became pregnant, from which condition, and her previous size, she suffered so much as to be confined to a horizontal position for several months. Several fibroid masses as large as cocoanuts could be felt projecting from the fundus, and one the size of an orange, in front of the cervix.

Labor lasted fourteen hours, pains normal, and no unusual suffering, or hemor-

rhage, in fact the tumours appeared to interfere in no way with the process of parturition. Next day, the contracted uterus and tumours measured a foot from the symphysis to the fundus. Six months later, the uterus was nearly normal in size, and the fibroids had almost entirely disappeared.

Case 2, had two globular fibroids as large as cocoanuts, growing from fundus and sides of uterus. Pains feeble and infrequent in second stage, forceps used, child living, no post-partum hemorrhage. As in No. 1, the tumours almost entirely disappeared by absorption.

Case 3, is of much value, as the Cæsarean operation appeared inevitable, until the fibroid was forced up above the promontory of the sacrum by the fist in the vagina, and retained by bringing down the child's head with the forceps, after which the labor was soon completed; the uterus contracted firmly, and there was no hemorrhage.

Case 4 was of the same character as No. 3, and treated the same way. Child presented by the feet, and was still-born.

This is a very important series of cases, as the treatment shows how the Cæsarean operation may be sometimes avoided in a condition in which it is unusually fatal when performed.

Dr. JAMES BRAITHWAITE describes *A New mode of treating Certain Cases of Retroflexion of Unimpregnated Uterus*. The plan is first to dilate the organ with a laminaria tent; then wash out the parts with a weak iodine lotion; next

“Take a piece of brass wire about eight or nine inches in length, and no thicker than can be easily bent to a right angle with the first three fingers and thumb of the right hand; one end should be covered with India-rubber tubing to a length of half an inch less than that of the uterine cavity as ascertained by the sound. This must be very securely and neatly closed at the end, the end of the wire being inclosed but not included. The tubing should fit the wire pretty closely, and it should be firmly secured to it by a strong hemp ligature close to its proximal end. At this end of the tubing is to be placed a button, fixed to the wire, not to the tubing. This, which is the uterine end of the instrument, is now to be bent into a curve somewhat like that of the uterine sound, the point of the greatest curvature coinciding with the os internum when the instrument is introduced into the uterus, which is the next step. The flexion of the uterus must then be rectified, just as is commonly done by the sound. An inflatable rubber-ball pessary, having a small central tube, is now to be threaded on to the wire projecting from the vagina, and passed well up to the os, in order to retain the antelevator in the uterus by its upward pressure against the button when it is inflated with air. The wire projecting from the vagina is now to be bent backward to a right angle between the buttocks, so as to lie closely in the sulcus between them.”

Dr. Braithwaite keeps the woman in bed four days, then washes out the vagina with Condyl's fluid and water, inserts a Hodge pessary, still retains the patient in bed, resorts to a large dose of ergot once a day, and vaginal injections of cold water, which he continues for three days. He has only tried the plan four times in as many years, reserving it for extreme cases.

This article gave rise to a very long discussion for and against stem pessaries, stem supports, laminaria tents, etc., in which the Hodge instrument appeared to be the most commended, although there was a great difference of opinion as to conditions and treatment in uterine flexures.

The Pathology and Treatment of Membranous Dysmenorrhœa is the title of a very able and valuable article by Dr. JOHN WILLIAMS, based mainly on observations made in fourteen cases of the disease, and a large number of microscopical studies of the membranes discharged by these and other patients. We shall not attempt to give any of the cases in detail, but simply mention a few remarkable facts, and the inferences drawn by the author.

Case 1. A single woman of 30; for last three years passed membranes at each

period, and also about the middle of interval, with no hemorrhage at the latter; has epistaxis and hæmatemesis during and just before menstrual epoch, and is also subject to occasional convulsions. Fifteen membranes examined. Those passed in interval were vaginal only; and during menstruation vaginal and uterine; former tough, opaque, whitish, and sometimes gave a complete mould of the vagina, with all its superficial markings; latter brownish, stained with blood, incomplete in form, and presenting the structures usually met with in decidua. Case 2 passed from her uterus a flattened membranous triangle, of a brownish-gray colour, stained with blood, measuring two and a half inches in length, having a central canal half an inch wide, and dividing off to the two cornua, where it was impervious. About twenty-five membranes examined. Case 3 menstruating for thirteen years; married, but sterile; believed to have always cast off a membrane at her menstrual period, and without pain, except for the last three or four years. Case 4 passed a complete triangular membranous bag, with an opening at each cornua.

Treatment "should be prophylactic," addressed to "those conditions which are likely to cause excess of fibrous tissue in the uterine wall. Every means should be adopted to favour the physical development of the young girl. The puerperal state should be watched, and acute inflammations attacked as soon as they arise, with a view to favour complete resolution. Once the condition is established, the only means whereby a cure is likely to be effected, is electricity." "The continuous current has proved successful in the hands of Solowieff."

Conclusions. 1. "The dysmenorrhœal membrane is not the product of conception, but the decidua ordinarily shed as *débris* with each menstrual epoch."

2. "It is expelled as a whole or in masses, in consequence of the presence of an excess of fibrous tissue in the wall of the uterus; this excess is due to imperfect evolution at puberty, imperfect involution after parturition or abortion, or it is the product of acute inflammation."

3. "The membrane is neither the result of an ovarian congestion, nor of an hypertrophy of the ordinary decidua."

4. "The chronic inflammation present is usually the result of the monthly expulsion of the decidua from the uterus, and plays an accidental part only in its production; the inflammation may, however, be independent of the expulsion of the membrane, but usually it has no causal relation to the formation of the latter."

5. "Sterility is not necessarily associated with the affection, but is the result of the condition induced by the expulsion of the membrane from the uterus—inflammation of the uterus and ovaries."

6. "The membrane may be expelled without pain."

7. "Inflammation of the uterus greatly aggravates the suffering caused by the passage of the membrane along the cervical canal."

8. "Great relief may be obtained by curing the inflammation of the cervix, though the membrane continues to be expelled every month."

9. "In order to effect a cure, the structure of the whole of the body of the uterus must be altered."

Dr. GALABIN reports a case of *Suppuration of the Uterine Cavity resulting from Occlusion of the Cervix*. It was mistaken for one of ovarian tumour behind the uterus, and the part punctured under this belief, giving exit to a collection of pus. The trocar opened the peritoneal cavity on its way into the uterus, and set up a general peritonitis, of which the woman died in a few days.

The patient was a widow of 63, and mother of eight children, who dated her complaint from seven weeks before she came under observation. Her uterus proved to be sharply retroflexed, and affected with cancer at the internal os, which occluded the cervix and caused a dilatation of the cavity to the size of a foetal head, but did not manifestly affect the external part of the cervix.

Forgotten Pessaries.—Dr. GALABIN took out a Zwanke pessary, which had

been worn six years continuously by a woman of 58, in whom it had produced vesico-vaginal and recto-vaginal fistulæ. Dr. Godson showed a ring pessary of wood that a woman had worn twenty-six years without being aware that she carried it; there was no ulceration. Dr. Edis found a Hodge pessary in a woman who wore it eleven years without knowing it. The discussion showed the importance of instructing patients to remove their instrument at night, and replace it in the morning.

Forceps in Breech Presentations were advocated by Dr. T. W. Agnew, but condemned by Dr. Barnes as inefficient and dangerous. He claimed that they compress the soft parts above the pelvis and the cord, which may cause asphyxia.

Prof. Tarnier's Forceps were exhibited and explained, but did not elicit any very marked evidences of approval, as was also the case when they appeared before our own Obstetrical Society.

On a Diagnostic Sign of Vaginal Hemorrhage during Parturition. By Dr. PAUL BUDIN, of Paris. Hemorrhages are mentioned as having been noticed to arise from ruptured varicose veins of the vagina, from wounds of the clitoris, and internal pudic artery. These are to be recognized by spots or streaks of blood found on the head or neck of the fœtus, while its body occupies the cervix and prevents the escape of uterine blood.

On the choice of the leg which should be seized in version for presentation of the upper extremity, by Dr. A. L. GALABIN. The author confines his remarks to cases where the liquor amnii has escaped, the uterus become contracted, and the bi-polar method rendered inadmissible. Dr. G., in opposition to the views of Sir James Y. Simpson, Drs. Barnes, Tyler Smith, Meadows, and Playfair, advocates making traction on the near foot, as upheld by Prof. Martin, of Berlin, Prof. Hodge, Carl Brann, Schroeder, Leishman, and others, particularly the older writers; and claims that the method is not only easier, but based upon true mechanical principles, which he demonstrates by diagrams, to show direction of force and rotation; and calculations, to establish the mechanical advantages of the method recommended over that of Drs. Simpson, Barnes, etc. He sums up the advantages as follows:—

1. "The rotation of the fœtus on its antero-posterior axis by means of the lower leg is generally effected at a greater mechanical advantage, and therefore by a less force than the combined rotation on its transverse and longitudinal axis, by means of the upper leg; while it is sufficient to produce elevation of the shoulder, unless the fœtus is dead and flaccid, or uterine rigidity extreme, and the upper leg may with no diminished advantage be afterward brought down, if required."

2. "If the lower leg be taken, and the noose placed upon the prolapsed arm, the operator has complete command of the anterior arm in the subsequent extraction."

3. "By taking the lower leg, the more usual dorso-anterior is not converted by the version into a dorso-posterior position, a point of very minor importance, but one which may in some cases be worthy of consideration."

Complete rupture of Perineum, by CHARLES ROBERT THOMPSON. A primipara, æt. 22, in giving birth at full term, to a fœtus affected with general dropsy, ruptured her perineum in this singular way: The head passed, and remained during a pain or two without any advance, "when suddenly the child's right arm was forced *through the mother's anus*, and in a moment, with one long effort, the body was expelled; the forearm lying on the chest, plowing its way completely through the whole length of the perineum."

Two silk ligatures were inserted at once, the parts dressed with lint steeped in carbolized oil, and the patient placed on her side, with her knees bandaged together. The stitches were removed on the third day, and bowels moved by

an aperient on the fifth, the parts having entirely closed. The patient was well and about in a month. The plan of immediate suturing the perineum in cases of rupture is rapidly coming into favour as the true method of treatment.

R. P. H.

ART. XXII.—*On the Source of Muscular Power: Arguments and Conclusions drawn from Observations upon the Human Subject under Conditions of Rest and of Muscular Exercise.* By AUSTIN FLINT, JR., M.D., Prof. of Physiology and Physiological Anatomy in the Bellevue Hospital Medical College, New York, etc. 12mo. pp. 103. New York: D. Appleton & Co., 1878.

SINCE Dr. Mayer, in 1842, first indicated the physiological relations of the great discoveries of Joule, Helmholtz, and Grove in the domain of physics, physiologists have earnestly sought to explain the hitherto incomprehensible phenomena of living beings by purely chemical and physical laws.

It is now taught in many quarters that the forces and laws of inorganic nature offer a ready and sufficient explanation of all the subtle processes of organic life. The simplicity and positiveness thus introduced into the study of vital phenomena has a charm which is very seductive; and if the hypothesis were only proven it would mark an era in the history of physiology the importance of which can scarcely be realized. The investigations on the source of muscular power, which are recorded in the *brochure* before us, are largely responsible for the materialistic tendencies of modern physiology. It is therefore fortunate that Dr. Flint, who is so justly eminent as a physiologist, and who has been one of the principal original investigators of the question at issue, should enter the following emphatic protest against this tendency:—

“Taking nature as she now appears to us, there seems to be little or no basis for what may be termed an immaterial physiology. The researches which I have made into the question of the source of muscular power are not in any way opposed to the known relations between matter and force; they have been directed simply toward the solution of the problem whether the food be concerned directly, by its transformations, in the production of muscular power, or whether muscular effort involve changes in the muscular substance itself, this substance being destroyed as muscular tissue, discharged from the body in the form of excrementitious matter, and the waste being repaired by food.”

The present essay was originally printed in the *Journal of Anatomy and Physiology* (Oct. 1877); and now, with many typographical corrections and some additional matter, appears in its present neat and attractive form.

The relation of food to animal work forms one of the very interesting and important chapters in physiology, for, aside from the purely scientific interest of the problem, its solution must exercise a vast practical influence upon the question of alimentation in health and disease.

Until recently, the well-known theory of Liebig, enunciated nearly forty years ago, has stood unquestioned; however, when the reactionary wave set in, it rolled rapidly to the other extreme, and Traube, with other German physiologists, have advanced a theory directly opposed to that of Liebig, *i. e.*, that the nitrogenous constituent of muscle is not destroyed in its action, but that the force is wholly due to the oxidation of non-nitrogenous matter, converted, through the mechanism of the muscular system, into motor power.

I believe the new doctrine of the source of muscular power numbers among its supporters nearly all of the prominent foreign physiologists; in this country, however, the tide of opinion in its favour was early arrested by the publication of the

thoroughly scientific experiments of our author made upon the pedestrian Weston in 1870. These experiments, which are analyzed in the volume before us, were the first, according to Dr. Flint, in which was adopted the method of investigating the influence of exercise upon the excretion of nitrogen by comparing the nitrogen eliminated with the nitrogen of food.

The attention of the profession was first permanently directed to the question under discussion in 1866 by Profs. Fick and Wislicenus, in their famous ascent of the Faulhorn, one of the Bernese Alps. These distinguished observers, though their experiment lacked that scientific precision necessary for the establishing of a great truth, assumed to have proven that the muscular system is a machine consuming in its work not its own substance, but fuel which is supplied chiefly by the hydro-carbonaceous articles of food. Of the many physiologists who have participated in the discussion, the two most prominent ones, representing opposite sides of the controversy as they do different continents, are Profs. Pavy, of London, and Flint, of New York. More than one-half of the little volume before us is devoted to a discussion of the experiments of these two observers upon Weston during certain of his celebrated pedestrian feats. In both series of experiments the proportion of nitrogen eliminated to that ingested during rest and during extraordinary exercise was ascertained, although Pavy failed to include in his estimate the nitrogen of the feces, which Flint considers an important omission. Both experimenters found an increase of nitrogen eliminated over that ingested during the days of walking, but the interpretation of this increase leads Drs. Pavy and Flint to very different conclusions.

We cannot, for want of space, give the figures and calculations of our author, but Dr. Flint plainly shows that by either method of calculation a large discrepancy exists between the amount of work actually performed and that which can be accounted for either by estimating the force-value of the muscle actually consumed, represented by the nitrogen excreted, or the force-value of the food taken. In the one case (Pavy) the excess amounted to over eleven per cent. of the work actually done, while in the other (Flint) the work accomplished was more than ten times the estimated force-value of nitrogenized food and muscle consumed, deducting the force used in internal work (respiration, circulation, secretion, etc.). This discrepancy is only explicable on the assumption that serious errors exist both in the measurement of the force produced and in the calculation of the force-value of matters consumed. In speaking of the data upon which these calculations are based, Dr. Flint says:—

“The reduction of level miles walked to foot-tons is inaccurate; an accurate estimation of the force used in circulation, respiration, etc., seems at present impossible; and the assumption that the force-value of nitrogenized food, calculated by reducing heat-units developed by burning the food in oxygen to foot-tons, can be applied absolutely to the changes which food undergoes in the human body, has no argument in its favour drawn from experimental facts. Still, no one can say that matter can be actually destroyed, that matter can undergo certain chemical changes without the development of force, or of heat which represents force, or that force can be developed in the body without some change in matter. My only argument is, that purely physical laws cannot as yet be applied absolutely to the operations of the living organism.”

Dr. Flint strongly and repeatedly insists, in the body of the essay, upon the danger of relying too implicitly upon the method adopted by Pavy, Haughton, and others for estimating in foot-tons the force used in circulation, respiration, and the production of animal heat.

When we recall the fact that the estimates of different observers of authority present variations of more than one hundred per cent., we fail to see how an unprejudiced mind can refuse to accept the author's conclusion: “I cannot see

how we can avoid banishing, for the present at least, these uncertain and erroneous processes from physiological research, as applied to the theories of muscular action and the source of muscular power."

The essay concludes with a full and very excellent *résumé* of the argument in the text, which our limited space alone prevents us quoting in full. In justice to the reader, however, we cannot omit the following closing paragraph:—

"IX. Finally, experiments upon the human subject show that the direct source of muscular power is to be looked for in the muscular system itself. The exercise of muscular power immediately involves the destruction of a certain amount of muscular substance, of which the nitrogen excreted is a measure. Indirectly, nitrogenized food is a source of power, as, by its assimilation by the muscular tissue, it repairs the waste and develops the capacity for work; but food is not directly converted into force in the living body, nor is it a source of muscular power, except that it maintains the muscular system in a proper condition for work. In ordinary daily muscular work, which may be continued indefinitely, except as it is restricted by the conditions of nutrition and the limits of age, the loss of muscular substance produced by work is balanced by the assimilation of alimentary matters. A condition of the existence of the muscular tissue, however, is, that it cannot be absolutely stationary, and that disassimilation must go on to a certain extent, even if no work be done. This loss must be repaired by food to maintain life. A similar condition of existence applies to every highly organized part of the body, and marks a broad distinction between a living organism and an artificially constructed machine, which latter can exert no motive power of itself, and can develop no force that is not supplied artificially by the consumption of fuel or otherwise."

In order to meet the objections which might be urged by some, that he had failed to include in his calculations the heat-producing and force-producing power of the non-nitrogenous food taken during the walk, Dr. Flint, in a short appendix, supplies this omission.

In the experiments made on Weston in 1870, the quantity of non-nitrogenous food consumed was carefully weighed. Calculating the force-value of both the nitrogenous and non-nitrogenous matters used, and adding the force-value of his loss of weight, the aggregate represents the sum of the forces with which Weston was to accomplish his pedestrian feat and maintain circulation, respiration, etc. This calculation, however, fails to account for the muscular work actually performed in walking the three hundred and seventeen and one-half miles in five consecutive days. There is still a deficiency of more than ten per cent. which cannot be accounted for, and which shows, according to our author, "the fallacy of such estimates, and the impossibility of accounting for muscular work actually performed, even when we include the heat-value and the force-value of non-nitrogenized food."

In closing our imperfect notice of this monograph, we cannot commend it too highly as an important contribution to the literature of the subject of which it treats. It deserves, and doubtless will receive, a warm reception from the profession.

W. J. C.

ART. XXIII.—*Albrecht von Graefe: Sein Leben und Werken.* Von Dr. EDUARD MICHAELIS, Augenarzt in Berlin. Berlin: Druck und Verlag von G. Reimer. pp. 196, 1877.

Albrecht von Graefe: His Life and Works. By Dr. EDWARD MICHAELIS.

It is now eight years since von Gräfe died, and this small volume is the first effort to acquaint the world at large with the notable events of his private life,

and give a connected *résumé* of his labours in his chosen field. His professional life began in 1850 and ended in 1870, at the age of 42; yet within that short space of twenty years he made an impress upon the medical spirit of his time that has no parallel in the history of medicine. He found ophthalmology as empirical as an art and as undeveloped as a science as any other department of medicine; he left it both as a science and an art far in advance of all other branches. And this tremendous stride is to be attributed almost wholly to his own individual labours or the labours of those whom his enthusiasm in the study of this branch inspired with a desire to work in the same field. It is true he was fortunate in beginning his career just at the time the ophthalmoscope was invented, but even without this invaluable instrument he would have made himself felt in the development of that specialty to which he had determined to give his powers.

The application of the ophthalmoscope only gave him an additional means to carry out the plan of study and investigation which he had determined to follow—a plan which he learned from Virchow and the French. This was the careful study of the clinical history of each disease in conjunction with the pathological alterations associated with it.

When he looked through the first ophthalmoscope which Helmholtz sent to him, "his eyes glistened, his cheeks flushed, and he cried out, 'Helmholtz has opened a new world to us.'" His far-seeing eye comprehended at this first glance the richness of the field that was now for the first time opened up.

To write the life of such a man as this is almost equivalent to writing a history of the progress of modern ophthalmology. There is no branch of the science to which he did not contribute. A great deal of this work has gone into our general stock of knowledge, and the student of to-day is not aware, in many instances, of its prime source. It is our purpose in this article to point out, as briefly as may be possible, at least the most prominent and important additions he made to the science he may almost be said to have founded.

Dr. Michaelis has divided his work into three parts, corresponding to the three principal periods of his life. 1. His early and student life, from 1828 to 1848. 2. The period of travel for scientific study, from 1848 to 1850. 3. His professional career in Berlin, from 1850 to 1870.

We have time and space for only a hasty glance at the first two divisions.

His father was Dr. Carl Ferdinand von Gräfe, who also worked in the department of ophthalmology. He wrote several papers on the subject, and published in conjunction with Walther the "*Journal der Chirurgie und Augenheilkunde*." Gräfe, the younger, however, does not seem to have imbibed his love for that branch from his father. He had his attention first seriously turned to ophthalmology when he went to Prague and saw Arlt operating; afterwards it became fixed when he went to Paris and frequented the clinics of Desmarres and Sichel. His letters from Paris during this time are highly interesting. He was very fond of Parisian life, and his great ambition was to establish himself as an oculist in that gay metropolis.

In fact, in none of his characteristics, personal or professional, was he a typical German; and the engraved portrait which serves as a frontispiece to the volume represents more nearly the American, so-called, than any other nationality. And indeed in a certain restless energy and tireless industry he did approach quite near to the characteristic American of to-day. In another particular he was also conspicuously removed from the average German man of science. All his labours, all his investigations, had an eminently practical bearing. When he went into theoretical speculation at all it was to draw some important practical deduction therefrom for immediate application to a case on hand.

In the autumn of 1850 Gräfe returned to Berlin, having completed his scientific

travels, and proceeded at once to establish himself as an oculist in that city. On the 1st of November his clinic was opened. It was in the second story of a small unpretending house in Behrenstrasse.

"In one of the front rooms there were two tables placed together; on them were found small black vials containing solutions of nitrate of silver of various strengths, one containing a solution of acetate of lead, and two others containing simple tincture of opium and tinctura opii crocata. Sticks of nitrate of silver and sulphate of copper lay upon the table. By the tables were two chairs, so placed that the one on which the patient sat should face the light, whilst Gräfe's had its back to the window. At some distance stood a case containing a set of Luer's eye instruments. On the other side of the room stood an old-fashioned writing-desk on which prescription paper lay. A narrow corridor and a small waiting-room completed the polyclinic. From a tailor in Johannesstrasse were rented two plain rooms with green shades, furnished with beds, bed-curtains, etc., for the reception of operated cases. Such was the unpretentious beginning of 'Gräfe's clinic,' to which before the lapse of ten years every country in the whole inhabited world sent each year its contingent."

In view of the great fame this *maison de santé* afterward attained, an incident relative to the first two patients operated on will be of interest. The two first patients which occupied the beds in the room rented from the tailor were an old blind organ-grinder on whom he performed an iridectomy, and an old toper on whom he performed the operation of extraction of cataract. During the second night the old toper was seized with delirium tremens, and tore the bandage from his eyes and proceeded to attack the organ-grinder, beating him over the head and face severely. The toper died in a few days, but the wound in the cornea was found on examination to be well united. The organ-grinder made a good recovery, but his first experience in the hospital so frightened him that he could not be prevailed upon to submit the other eye to operation.

There was nothing notable in his private life apart from his scientific career. He lived as became a gentleman of fortune, was married in 1861 to Countess Anna Knuth, of Denmark, and devoted himself and his means to science and humanity. Of commanding, yet fascinating appearance, his face had so mild and benevolent a look that he was known in the streets of Berlin as the "Christus," such was his resemblance to the ideal of Christ as given to us by the old masters.

His first scientific work of importance was his inaugural treatise when he was made *privat docent* in the University of Berlin. Its subject was "The action of the ocular muscles." He it was who first investigated the action of the muscles moving the eye, in healthy and in diseased conditions; and the article above mentioned, his thesis when made professor of ophthalmology in the University in 1866, on the "paralysis of the ocular muscles," and the first article in the first number of his *Archives* on the "physiology and pathology of the oblique muscles of the eye," are among his most important contributions to the science of ophthalmology.

In four years, the material of his clinic had increased so much that he deemed it necessary to establish a journal, which should enable him to give to the world the fruits of his own labours, and of those associated with him in this extensive field. Consequently, in the autumn of 1854 appeared the first number of the "*Archiv für Ophthalmologie*, herausgegeben von Dr. A. von Gräfe." Of the 480 pages, which the first number contains, the whole was written by Gräfe himself, except about 86 pages. Besides the article on the oblique muscles already mentioned, this number contained important papers on "diplopia after squint operations and incongruence of the retina," and "diphtheritic conjunctivitis and the employment of caustics in acute inflammations."

The concluding chapter of the last article—on the use of caustics in acute in-

flammation of the conjunctiva—is exceedingly important, since it sets forth the philosophy of our present routine of treatment of these most common affections of the eye.

The so frequent and general application of astringents—the nitrate of silver in particular—even by general practitioners for blennorrhœa of the conjunctiva, is sufficient reason, we think, for quoting rather freely from this article, and especially so as in no text-book in English has so full an explanation of the action and indications for astringents been given.

“If a moderately strong solution of nitrate of silver, say x grs. to the oz. of water, be dropped into the healthy eye, there follows immediately upon its application an irritation of considerable severity, varying very much in different individuals: the eye cannot be opened, it weeps, becomes red and hot, and there is an inclination to apply cold water for its relief. This irritation increases and reaches its maximum in about ten minutes; then there appears a whitish secretion. If the eye is opened at this time, it will be seen that the eschar, which originally covered the entire mucous surface in the form of a whitish mucus, has become loosened at its edges, and is being rolled together; it is this, together with the tears and the secretion of the conjunctiva, which furnishes the whitish mucus mentioned above. Its presence in the eye is manifested by an uncomfortable feeling of pressure, similar to that caused by a foreign body. After some hours, the eschar is thrown off, and then we see a somewhat red and raw mucous membrane, which secretes a thin mucus. The raw condition of the mucous membrane may pass away soon, or persists for some days. . . . We can distinguish two different periods in the effects following cauterization of a healthy eye:—

“1. The period in which the eschar first loosens itself at the edge, and is lifted from the underlying mucous membrane by a layer of secretion, and is then rolled up in the conjunctival sac, mostly in the neighbourhood of the retro-tarsal fold, and is finally thrown off in the form of a white secretion. This is the period of irritation, which is manifest by pain, inability to open the eye, lachrymation, redness, and more or less swelling of the edges of the lids.

“2. The period of regeneration, in which the conjunctiva loses its raw, red appearance, through the reproduction of new epithelium. The period of irritation has now passed away, and there only remains a feeling of weakness or contraction of the lids.

“The special healing action of caustics in inflammatory affections of the conjunctiva is, above all, a matter of experience. We will, in order to bring this experience under our control, communicate somewhat in detail all the circumstances in connection with it. If a drop of a very weak solution of nitrate of silver (gr. ss-j to ʒj) is put into an eye suffering from an acute conjunctivitis, it causes some pain, the inflammation is somewhat increased, but no remission in the inflammatory symptoms referable to the medicine is observed to follow. Older authors were evidently aware of this, for they said that during the acute stage of conjunctivitis astringents are not useful, but are to be avoided, for in the irritated condition such astringents act as irritants, increasing the inflammation. When, under the same circumstances, we apply a caustic solution of the strength of x gr. to ʒj, the pain immediately following the application is not proportionately increased, but becomes more prominent at the period of the throwing off of the eschar, since at the beginning the eschar protects the raw mucous surface. The pain reaches its maximum when the detached eschar is rolled up and the raw mucous surface is completely exposed; the redness also increases very much at this time, as well as the other symptoms of irritation, spasm of the lids, heat, etc. But, during the period of regeneration, we see not only this increase of inflammatory symptoms subside, but also such a considerable remission as regards the previous condition, that after the lapse of this period, often already after twenty-four hours, the eye regains almost its normal appearance; and especially does this occur if, during the period of separation of the eschar, cold fomentations are applied. . . .

“For the more detailed method of application of the remedy I offer the following points for consideration:—

“1. The energy of the application must be proportional to the degree of in-

jection and swelling; otherwise the caustic acts only as an irritant, and no remission follows.

"2. Especially is it important, if we wish to obtain the full effects, that the caustic come in contact with the *whole* of the conjunctival surface. It is also important to limit the caustic action to the various parts proportional to their degree of implication.

"3. If the intumescence of the mucous membrane is so considerable that it appears necessary to bring about a collapse as soon as possible, it is advisable to *scarify* at each cauterization.

"4. After each cauterization cold applications must be used until the eschar is thrown off.

"5. The proper repetition of the cauterization is of special importance. When, after the reaction following the cauterization (increased heat, swelling, etc.) has subsided, on an inspection of the mucous membrane, the last eschar, or the exudation accompanying it, is found to have been thrown off, and the whitish secretion following the cauterization is reduced to a minimum, and a collapse has evidently set in, but no sign of a recrudescence of the blenorrhœa (thin secretion, renewed difficulty in opening the lid, more swelling and heat) is manifest, then the cauterization may be repeated.

"6. The presence of an affection of the cornea is supposed to offer special indications for the employment of the remedy. With a view of obtaining a settled conviction on this point, I have instituted an accurate examination of a large number of cases, and have arrived at the following conclusion: that an already existing, consecutive corneal affection in whatever form, whether perforation is present or not, offers no contraindication to the employment of caustics in accordance with the rules laid down above, but with proper careful neutralization so much the more urgently demands it.

"7. That of all the caustic means which are used in the treatment of acute catarrho-blennorrhagic affections, the nitrate of silver is the most reliable. Its advantages are: 1. A solid eschar, which, with careful neutralization, can be limited to a desired part, and its action accurately calculated. 2. A copious serous secretion at the commencement of the period of detachment, which is rapidly followed by a collapse of the vessels—therefore the most certain counteraction against the existing alteration. 3. The possibility, through combination with nitre, as well as through neutralization (with salt water) of controlling its action with great exactness."

In a postscript to the first number of the *Archiv*, Gräfe gave notice that in future he would have the editorial co-operation of Prof. Donders of Utrecht, and Prof. Arlt of Prague.

To give a list even of the valuable papers that appeared in the subsequent numbers of the *Archiv*, from the hand of the principal editor, would occupy many pages. No part of the domain of ophthalmology but received careful consideration at his hands. It would be impossible, in a notice of the length this must necessarily be, to give a synopsis of all these contributions to ocular pathology and practice. The special student must search for these in the volumes themselves. We will select from them the articles on two subjects with which his name will be most generally associated, namely, glaucoma, and the extraction of cataract.

Glaucoma, or "green amaurosis," as it was called, had been for all time the *nolle me tangere* of ophthalmology. No settled views were held either as regards its pathology or therapeutics. Gräfe's studies in this line, as was habitual with him, were begun from a practical standpoint. His great aim was to find a remedy for a disease whose course had heretofore only ended in blindness. His attention was early directed to the prominent and characteristic symptom of the affection—increased hardness of the globe; and among other means for the relief of the condition he tried paracentesis of the anterior chamber. This was followed by marked relief, but it was not permanent. If now, he reasons, we can

find a means by which this alteration can be rendered permanent, we shall have found the long-sought-for remedy. His previous experience as to the effect of iridectomy led him to hope that in this operation a means was at command for effecting a continuous reduction of the intraocular tension. In 1856 he made the first operation of this character, and in 1857 he published his classical paper on the subject "On Iridectomy in Glaucoma and the Glaucomatous Process" in the third volume of the *Archiv*.

He was the first to introduce the operation of iridectomy into Germany. He had learned its value from Desmarres in Paris. He demonstrated not only the general innocuousness of the operation, but pointed out its great usefulness in inflammatory affections of the iris, choroid, and cornea. He showed conclusively that it was one of the most powerful antiphlogistics in the hands of the ophthalmic surgeon. But, as is common with all valuable discoveries, his method met with opposition, and, in places, of a violent character—notably in England. The great Nestor of British ophthalmology, Bowman, however, came to the front, and soon the whole world gave way, and now the diagnosis of glaucoma can mean only the performance of iridectomy. Different practitioners may have different views regarding the *modus operandi* of the procedure, but no one doubts its efficacy.

Gräfe was the first, too, to point out the true meaning of the appearance of the optic disk in glaucoma cases. Jaeger had considered the peculiar appearance of the disk in such cases as due to a bulging of the end of the nerve. Gräfe at first fell into the error of so thinking also, but afterwards convinced himself that the displacement of the vessels was not forward, but backward—a view which was verified soon after by H. Müller on section of a glaucomatous eye.

The second great work of Gräfe's life was the perfection of the operation for extraction of cataract. There has been from time to time a disposition among ophthalmic surgeons to try new methods, and some oculists of eminence have brought forward operations of their own, but none have come into anything like general use. The majority of these methods aim to do away with the iridectomy, which indeed is a laudable endeavour, but the plan yet remains to be found which can save the iris and yet be so well adapted to all cases as they come as the latest improved method of Gräfe. As Gräfe himself remarked, his method is not only adapted for the safe removal of the lens, but is especially indicated in various conditions, which are very frequently found associated with cataract—such as an increase of intraocular tension, affections of the iris, choroid, cornea, etc. Experience has shown the correctness of this view, for most of the new methods are recommended by their authors for cases of simple, uncomplicated cataract. Wecker himself now selects the cases for his "peripheral flap." He only does it when the case is one of simple cataract unaccompanied by indications which Gräfe had pointed out as requiring an iridectomy.

Gräfe had his attention first directed to the extraction of cataract when he went to Prague to observe the practice of Arlt, since in Berlin, at that time, no operations were done but by depression. When he went to Vienna he saw Jaeger extracting certain kinds of cataracts by a linear incision. It is certain that he early made a study of cataract extraction, since in the second number of the first volume of the *Archiv* he has a paper on "Linear Extraction of Cataract, with Remarks on the Diagnosis of the Consistency of Cataracts, and on the choice of the various operative procedures." In this paper he points out the limits of the usefulness, as he then considered, of the linear method. He did not deem it suitable for cataracts with hard nuclei. Five years later, however, in 1859, he published an article in his *Archiv* on "Two Modifications of the Cataract Operation." The two modifications in question were, the making of

an iridectomy and the removal of the lens with a spoon. He was led to make the iridectomy because he found otherwise a difficulty in the introduction of the spoon, and as one of the most pernicious results of extraction was iritis, he hoped, from his now extended experience in iridectomies, to be able to forestall such an untoward event. These modifications were first applied to the linear incision, which was made on the temporal side of the eye, but he afterward applied them to the flap method, which he still continued to practise.

Gräfe was, however, not alone in the employment of the spoon. Critchett and Bowman, of London, both began about this time to use it. Jacobson, of Königsberg, issued a pamphlet on "A New and Dangerless Operation for the Cure of Cataract" in 1863. This was dedicated to "his dear friend and teacher, A. von Gräfe." In this paper Jacobson suggests the peripheral incision, made upward—lying at its base at least—in the corneo-scleral junction. He also pointed out the almost absolute necessity of making, at the same time an iridectomy, and, in passing, paid a tribute to Gräfe for his great work in demonstrating the immense value of iridectomy under such a variety of circumstances. Gräfe, in his turn, gave Jacobson the credit of introducing the scleral incision. In the third number of the eleventh volume of the *Archiv*, Gräfe gave a full exposition of the whole subject. In this he still retains the name of "modified linear extraction." In another article in the 14th volume, he changes the name to the "peripheric linear extraction." In the meanwhile he had gradually abandoned the use of traction instruments except in rare cases, and the method was now complete as we have it to-day. It will be seen that what is now called Gräfe's method was not the result of a happy accident, but was of that slow growth which must be enduring. Progress was made step by step, and the election from all the other plans and methods was made with great caution, and only adopted as a part when ample experience had proven their right to acceptance. The ready exit of the lens, and the accurate coaptation of the wound, were secured by the linear incision; the danger to sloughing of the cornea was avoided by the peripheral situation of the wound; the danger of iritis was lessened by an iridectomy. It is doubtful whether any other plan will ever be devised which will combine all these advantages.

The temptation is great to take up other subjects on which Gräfe threw the light of his genius, but space is wanting, and enough has already been given to show that Gräfe has won his way justly not only to the position of one of the greatest benefactors of his race, but to the very highest rank in science to which a man may hope to attain.

S. M. B.

ART. XXIV.—*Lectures on Medical Jurisprudence*. By FRANCIS OGSTON, M.D., Professor of Medical Jurisprudence and Medical Logic in the University of Aberdeen. Edited by FRANCIS OGSTON, Junior, M.D., Assistant to the Professor of Medical Jurisprudence, and Lecturer on Practical Toxicology in the University of Aberdeen. 8vo., pp. xii. 663. Philadelphia: Lindsay & Blakiston, 1878.

ONLY a few months ago we had occasion to offer to the readers of this Journal¹ some critical observations on the (then) last published work on medical jurisprudence—*Woodman and Tidy's Forensic Medicine and Toxicology*. We then expressed the hope that the recent rather cumulative publication of works in this

¹ January, 1878.

department of science was indicative of an increasing appreciation of the importance of a knowledge of legal medicine to both the physician and lawyer. We are now confronted with yet another large and handsome volume upon the same subject, by a well-known Scottish authority, and bearing the American imprint of one of our established medical publishing houses. We may, at the onset, reiterate the hope before expressed, that the appearance of the present work, like that of its predecessor, affords a healthful indication of a growing interest in matters pertaining to forensic medicine.

The work of Dr. Ogston comprises forty-four lectures delivered by him in the University of Aberdeen. They were intended, as the author informs us in his preface, to supply "a work containing the various forms of Scottish medico-legal procedure, differing as they do in many respects from those of England." Accordingly, throughout the volume, just prominence is given to Scottish law decisions and practice. We do not propose to follow these lectures in detail, or to offer a critical analysis of each one, however replete with matters of interest and importance. We shall notice only such portions as seem especially suggestive, since there must, necessarily, be much in such a book that has already exhausted the attention of the reviewer.

In the opening lecture, we think that the distinction between the *ordinary* and the *expert* witness is drawn with scarcely sufficient accuracy. The author gives us some interesting information in regard to the Scottish mode of criminal prosecution, which differs in certain important particulars from the English and American practice. In Scotland, the prosecution of crime is not left, as in England and the United States, to the injured individual or his friends, but is intrusted to a public officer, the Lord Advocate, or his deputies (answering to the *Procureur Général* of France), at the public expense. On complaint being lodged before the proper officer of the borough, county, or district where the crime was committed, the offending party, after examination, is committed to prison for further examination. There is no grand jury, as with us, to first examine into the merits of the case, and then either find a true bill, or else ignore it altogether; but the whole evidence is brought together, reduced to writing, and then submitted to the Crown Counsel; and it serves as their brief on the trial.

This investigation, or *precognition*, as it is named, determines the Crown Counsel at Edinburgh as to whether the prisoner shall be tried or discharged. Should the decision be to go on with the prosecution, "the trial takes place at the High Court, at the Circuit, or at the Sheriff Court; and it is conducted by the Lord Advocate, or by one of his deputies."

The Scottish mode of dealing with the witnesses also differs from our own and the English: "At the commencement of the trial the witnesses are locked up in the charge of an officer of the court, and are separately called and examined publicly on oath."

By the Scottish law there appears to be absolutely no escape for a medical man being compelled to act as an expert witness for the precognition, or at the subsequent trial. He cannot evade it, even on the plea of ignorance; the compliment, at least, is paid him of supposing him to be fully adequate to the occasion—a woe!ful mistake, as is not unfrequently shown. And, according to the author, "a fee is rarely received for his services on criminal occasions." Contrasting this unfavourable position of the Scottish medical witness with that of the witness in the courts of the United States, the author seems to think that the latter has rather the worst of it. He says of him: "His attendance, while compulsory, does not entitle him in criminal cases to any fee, whether cited either for the prosecution or the defence." This remark requires some qualification. With us, no physician can be compelled to act as an expert witness, if he asserts his incom-

petence to give an opinion touching the matter at issue. True it is, that incompetent witnesses do often thrust themselves forward in our criminal trials; but that is their own fault. Again, the expert witness is always entitled to at least the fee of an ordinary witness—paltry though this may be, together with mileage; and certainly, in at least a few of our States, he is allowed an extra compensation for his services, and he may even refuse to give his opinion without a previous agreement for an adequate compensation.¹ Again, in criminal cases in the United States, and especially in capital cases, the defence would hardly venture to entrust their cause in the hands of a *reluctant* expert witness: and surely he would be a reluctant witness who had been dragged away, hundreds of miles perhaps, from his home and business against his will, and compelled to give his services without any adequate compensation!

The author gives a timely caution to the medical expert in the matter of properly qualifying himself on all the points connected with his testimony; and he very properly animadverts upon the unprofessional conduct of those "volunteer" experts, who are ready on any occasion to obtrude their services, and especially in capital cases.

The succeeding chapters embrace the consideration of the various subjects usually treated of in lectures on medical jurisprudence. The remarks on the "Determination of the Age and Sex" in bodies found dead cover the whole ground relative to these subjects. The distinctions between real and spurious *hermaphroditism* are carefully drawn and accurately described. "Personal Identity in the Living and the Dead" is discussed with clearness. The most important medico-legal point connected with the former is the possibility of obliterating scars and tattoo marks from the body. The researches of Casper, Tardieu and others have settled this question affirmatively, in quite a large number of cases. Our readers will readily recall some remarkable instances of mistaken identity in the living, either from their reading, or possibly from their own personal experience. The *identity of the dead* is usually determined by the existence of certain well-remembered marks, scars, deformities, or artificial teeth. It will be recollected by many that it was especially by the latter circumstance (the artificial teeth), that the body of Dr. Parkman was recognized, in the celebrated Webster case that occurred in Boston in 1849. The attempt to identify the age, sex, and height of the deceased, by the inspection of the skeleton, is often successful in the hands of the expert legal physician.

The lecture on "Impotence and Sterility" is clear and comprehensive, embracing all that is known upon the subject. In that on "Rape," the author is sufficiently clear and precise in pointing out the facility with which a perfectly innocent man may be made the dupe of a designing mother, and implicated in a charge of rape upon her daughter, when the latter was in reality suffering from infantile leucorrhœa (vulvitis), a disorder frequently occurring in children brought up in filth and poverty. As the symptoms of this disease very closely resemble the effects of violation upon a child, it is easy to understand how readily such a criminal charge might be preferred, especially if there were favouring circumstances. Several cases are recorded by Ryan, Beatty, Sir A. Cooper, Devergie, and others, in which innocent men narrowly escaped the penalty of execution on such a false charge.

The question of the possibility of unconscious rape upon a woman under the influence of an anæsthetic receives only a passing notice. This subject, we think, has an important medico-legal bearing in another direction, namely, where the

¹ Lately so decided by the Supreme Court of Indiana. See papers on Medical Expert Evidence in Phila. Med. and Surg. Reporter, vol. xxxviii. Nos. 16 and 18.

charge is falsely made against an innocent man by a female who, while anaesthetized by ether or chloroform, may have experienced an erotic dream suggestive of the act imputed. It is well known that such is one of the effects of these anaesthetics on women: the patients themselves have confessed it. We need scarcely advert to the absurdity of admitting any such evidence on the part of the prosecutrix, *unsupported by a careful medical examination*; and yet, as will doubtless be remembered by some of our readers, this very absurdity was committed in our own city, some twenty years ago, in a trial in which a highly respectable dentist was convicted of such a felonious attempt, simply on the testimony of a female patient to whom he had administered ether before extracting or filling a tooth.

The jurisprudence of obstetrics is embraced in four lectures, comprising the subjects of "The Signs of Pregnancy;" "Proofs of Delivery, Recent and Remote;" "Unconscious Delivery;" "Protracted Gestation, as affecting the Question of Legitimacy;" "Live Birth;" and "Criminal Abortion." In reference to the subject of *live birth* in connection with that of *tenancy by the courtesy* (by virtue of which the husband of a deceased wife is entitled to a life-interest in her estate, provided she has live issue), it should be remembered that the law of Scotland differs from that of England and America as regards the *test* of a live birth. In the former, it is the establishment of respiration; by the latter, a child may acquire its civil rights, although it may be neither seen to breathe nor heard to cry, provided it exhibits *other* signs of life, such as pulsations of the heart or arteries, or even the spasmodic twitching of any of the muscles of the body. The Scottish law on this subject presents us with this singular anomaly, that while it requires proof of respiration or crying as evidence of a live birth, it does not recognize that the child is "born" unless it is completely separated from its mother; even although it may have cried lustily, with its head and shoulders extruded, but its feet still retained!

The lectures on "Criminal Abortion" and "Infanticide" convey a correct and sufficiently copious description of these subjects. Under Infanticide, the author reiterates the common observation concerning the difficulty of procuring a verdict against the woman, even in the face of the most direct evidence. Undoubtedly, this reluctance on the part of the jury to convict arises from a false sympathy with the unhappy culprit, which the stern demands of justice should disregard. But there will be always more or less of this sympathy in the community, as well as in the jury-box, when the punishment of the prisoner is contrasted with the immunity too generally accorded to the other party. Probably, as the author suggests, "the best means to secure the certainty of punishment for the commission of this crime would be to lessen the severity of the penal enactments." As the law at present stands, infanticide is regarded, like any other homicide, as a capital crime, although the prosecution is always bound first to prove the live birth of the child. Nor must it be forgotten that, by a singular freak of the law, it is *not* child-murder, technically speaking, to take away its life, if only its head and body be born!

As an evidence of previous live birth, the *hydrostatic test* receives a thorough examination. It must not be forgotten that this so-called test is never to be regarded as the true criterion of a live birth; it is merely the evidence of *respiration*, or rather of an inflation of the lungs, either naturally or artificially. We should not lose sight of the fact that a child may be born, and live some time, and die, *without respiration*. Here, of course, the hydrostatic test would be entirely at fault. Moreover, it would equally fail, on the other hand, in those cases where the child, when *partially* born (or even before its birth, when there is the *vagitus uterinus*), both breathes and cries, but dies before the birth is completed.

Four lectures are devoted to the consideration of the important subject of "Insanity" in its medico-legal bearings,—a field entirely too extensive for us to enter upon in the present article. The author discusses the subject with sufficient precision. He adopts the classification of Dr. Ray, with some modifications. The questions of *Civil* and *Criminal Responsibility* are treated with candour and ability. The subject of *the plea of insanity as a bar to judicial punishment* is fully discussed and criticized. In monomania, the doctrine is laid down that this does not disqualify the subject from "attending to his own affairs." Very little is said upon the subject of *suicide* as an evidence of insanity. Whilst many persons are disposed to regard suicide as unmistakable evidence of insanity, we think that there are unquestionable instances where this plea cannot be admitted, but where, on the contrary, a sufficiently coherent and cogent motive may be shown for its commission.

The chapters on "Death in its Medico-Legal Aspects" are among the most interesting and instructive in the book. Several points might be examined *in extenso*, did space permit; we will only mention *apparent death*, *cadaveric spasm*, and *cadaveric lividities* (external hypostases) *as distinguished from ecchymoses*. The formation of *adipocere* receives too hasty a notice, considering its occasional importance as a factor in determining the date of death.

The lectures on "Wounds" require no special notice from us, except in the matter of *blood-stains*, in which we think the author has not displayed his usual precision, either as regards the *guaiacum-test*, or the possibility of discrimination, by means of the microscope, between the blood-corpuscles of man and those of the more familiar domestic animals (the dog and rabbit excepted). He seems disposed even to question the ability of the accomplished microscopist to determine the differences in their size. Surely, he could hardly have read the papers of our townsman, Prof. J. G. Richardson, which demonstrate most satisfactorily, we think, the ability to make this diagnosis, provided a very high power is used.

In the chapter on "Death by Hanging," no mention is made, among the signs of this mode of death, of *fracture of the crystalline lens*. This sign, we believe, was first pointed out by Dr. Dyer in the year 1866, as witnessed by himself, in the eyes of an executed criminal, and also in the eyes of two dogs subsequently killed by hanging. Quite recently, these experiments were repeated by Dr. Arthur G. Allan, of this city, who made them the subject of his prize essay. Seven dogs were hanged; and in every instance, on examination after death—the proper care having been taken as regards the fall, etc.—there was an entire absence of the line indicating a fracture of the lens. Consequently, we must regard this alleged sign of death by hanging as not sustained by experiment.

In the lecture on "Death by Heat," allusion is made to the occasional preternatural combustibility of human bodies; but the author, very properly, we think, does not advocate the doctrine of the *spontaneous combustion* of the human body.

The subject of "Toxicology," although confessedly one of the most important to the legal physician, receives only a general notice from our author. The editor explains in the preface his omission of Special Toxicology from the work, "as this subject has been so often and so ably treated of in books devoted to that department of legal medicine." The four lectures devoted to General Toxicology contain many admirable hints to the practitioner, and the whole subject is handled with skill and precision. It is hardly necessary to particularize. Some timely warnings are given as to the impropriety of always drawing inferences from experiments on the lower animals with poisons, as to their effects on man, since it is well known that some of the inferior animals are not at all affected by articles which are fatally poisonous to the human subject—such as opium, hyoseyamus, belladonna, etc.

The possibility of introducing a poison into the body after death, with a view of imputing the crimes of poisoning to an innocent person, is very briefly alluded to. This is a subject of very considerable medico-legal importance, inasmuch as it has been shown¹ that in this way the liver and other viscera of the body may become contaminated through osmosis of the poison from the stomach, and may thus exhibit, apparently, the very best evidence of an *ante-mortem* poisoning. Such a serious mistake would probably be best avoided by an examination of the brain and spinal cord for the alleged poison; since it has been shown by M. Scolosuboff² that arsenic (and inferentially all the mineral poisons), when taken as a poison, is always found after death in large quantities in the brain and spinal marrow. In a case of the *post-mortem* imbibition of a poison, it is not possible that the latter could penetrate from the stomach to the contents of the cranium or the spinal column.

From our preceding remarks it will be gathered that we have a high appreciation of Prof. Ogston's lectures, and can cordially recommend the work as accomplishing all that the distinguished author promised for it. The few wood-cuts which accompany the letter-press are by no means on a par with the rest of the volume, which is beautifully gotten up, and bears the Edinburgh imprint.

J. J. R.

ART. XXV.—*Guérison de Six Aveugles-nés*. Par M. le Dr. LOUIS FIALLA, Chef du Service Chirurgical à l'Hôpital Philanthropie. 8vo., pp. 32. Bucarest, Thiel & Weiss, 1878.

THESE cases all occurred in the author's practice in two years. Certainly a very unusual experience, though the statement that but 14 cases of congenital cataract have been reported in 149 years would not give a correct idea of its frequency. This estimate may not be so very far wrong, however, if confined to the kind of cases appropriate for observations such as the author has made. These require a successful operation in a person who is of sufficient age to give an intelligent account of his impressions, and who has been entirely blind before the operation. In a large proportion of cases the operation is performed in early childhood, in many the patients have had more or less vision, enough to guide them partially, before the operation, and in some, it must be confessed, they have not very much after it; not only because the operation for congenital cataract, like all other operations, is subject to mishaps, but because even after the most perfect operation the eye is often found otherwise impaired or imperfectly developed.

Dr. Fialla attributes the unusual number of his cases to a want of confidence in the art of medicine among the lower classes in Roumania, which prevented them from applying earlier for aid. One of them had vision enough before the operation to render his case of little interest; the rest were excellent cases for observation. The oldest was 25 years of age, and the youngest 7; the average age being 15.

All the operations were by dissection, the lenses being freely lacerated at one sitting, and, though in several cases there was violent reaction, all seemed to have done well in the end.

¹ Trans. Col. of Physicians of Philadelphia, Nov. 1876, and number of this Journal for Jan. 1878, p. 284.

² Archives de Physiologie, No. 5, Août et Septembre, 1875.

The author's observations upon these patients, when they commenced to use their eyes, fully confirm the generally accepted views. He discovered in none of them any "innate ideas." None showed any indication of an instinctive use of their new-found sense; all had to learn to see. None could distinguish form or distance, or showed at first the slightest recognition by sight alone even of objects that had been familiar to touch for years. Like the famous Caspar Hauser, some found their first experiences painful rather than pleasant; and one who had earned his living as a street musician, and had gone about the town alone for years, lost himself when his eyes were opened, and had to beg some one to lead him home.

Three of the patients had nystagmus, and none of them had perfect control of the external muscles when they commenced to use their eyes. Sometimes a temporary strabismus was noticed when the attempt was made to fix an object. They soon learned, however, to direct the visual axis properly, and in only one case did any difficulty of this kind remain when the patient left the hospital. A similar disappearance of nystagmus after the restoration, or rather acquisition, of sight, is noted in an interesting case of congenital cataract cured by operation, reported by Dr. Wm. Hunt in the *Phila. Med. Times* for June 16, 1875. This result shows how much the delicate equilibrium established among the external muscles of the balls in perfect binocular vision may depend upon practice, and is encouraging to our therapeutic efforts in this direction in cases in which this equilibrium has been disturbed. The nystagmus which is frequently found in miners who pass their lives in subterraneous darkness, and which has attracted much attention lately, is interesting in this connection.

The author calls attention to the fact that the favourable issue in the case of the man 25 years of age shows that the diffused light admitted through a cataractous lens is sufficient to maintain indefinitely the sensitiveness of the retina. This passive suppression of vision is much less injurious to the sensitiveness of the retina (if indeed it is at all so) than the suppression of images formed upon it, but disregarded by the sensorium in the interest of binocular vision, as in the case of strabismus, partial opacities of the cornea, or some cases of difference in the refraction of the eyes. This fact is fatal to the argument sometimes used in favour of operating on monocular cataract to preserve the sensitiveness of the retina.

Observations like the foregoing seem to point to touch as the sense by which chiefly we discern the true state of our relations with the world about us. But, as the author says, all knowledge is from experience—"connaître demande une habitude antérieure;" and all the senses stand alike in need of exercise and education. The question naturally suggests itself, what kind of notions of things would a person have who had acquired them entirely from perfect vision without the aid of touch?

The perception of colours by persons who have newly acquired the sense of sight is a subject of great interest and some difficulty, and we cannot help suspecting that the views the author has adopted in reference to it may be the result of errors of observation. Of the first patient, a peasant girl 17 years of age, he says: "As to colours, she rapidly learned to distinguish black and white; then red and green. She hesitated over orange, yellow, and especially over the colours which are the result of mingling. The retina perceived the undulations of light, but needed education, which, no doubt, in time will be completed."

The second case recognized very easily black, white, and red, and with greater difficulty green, but none of the other colours. It is added that "it is possible that by exercise the faculty of recognizing colours will be perfected." The third patient added yellow to the list; of the other colours he said this verges on red,

or green, or yellow. The fourth had vision enough before the operation to gain some idea of colour. The fifth, a bright boy of seven years, could not name the colours, but showed his perception of them by saying that a white coat was of the same colour as a shirt, and that red objects were of the colour of fire.

The author attributes the imperfection of colour vision in these cases to an imperfection in the development of the retina, and is convinced that, after a time, vision will be perfected in this respect as in others. If these observations may be considered as reliable, it is interesting to note that in no case were the more highly refractive colours at the violet end of the spectrum recognized.

It is not stated what tests were applied, but there is reason to believe that the ability to name a colour was confounded with the physiological perception of it, and that the practice spoken of was rather an effort of the memory than a training of the chromatic sense.

As has been pointed out by Helmholtz and others, the names of colours have no meaning for the colour blind, much less for those who have had no vision at all, and the wonder is not that such persons find it difficult to learn the proper applications of these names, but that they are so soon enabled to make reasonably good guesses.

The simplest, and at the same time the best, means of testing the colour sense is that by comparison. Patients are directed to match strands of coloured worsted. This plan has been extensively adopted in Europe, and attention has been particularly called to it in this country by Dr. B. Joy Jeffries, of Boston.

In the report of the case by Dr. Hunt, it is said "of colour, of course, he had no idea." Certainly not of the name of any colour, but if when he commenced to see he was entirely destitute of the chromatic sense, though he afterwards could distinguish colours perfectly, the fact has an important significance. According to the Young-Helmholtz theory, which is pretty generally accepted as the best that can be done in that direction for the present, there are retinal elements for each of the three primary colours. If this is correct, it should be as natural to perceive these colours, at least, as to distinguish between black and white. At any rate it is not a complicated process requiring the aid of reason, and differs in that respect from recognizing the difference between a flat surface and a solid, or between a sphere and a cube.

The retina can be educated to nice distinction of delicate shades of colouring, but though the ability to perceive a primary colour may be improved it cannot be created, and it is almost universally admitted that a person once colour blind, except from disease, is always colour blind. Dr. B. J. Jeffries has recently written an interesting paper on the incurability of congenital colour blindness. Several French writers have, however, adopted different views. One of them, Delbœuf, maintains that Daltonism is not, according to the Young-Helmholtz theory, due to an atrophy of the red perceiving elements, but to a preponderating susceptibility to green and violet, and claims to have accomplished a partial cure in his own case by the use of a transparent reddish medium to subdue the green and violet rays, and "establish the equilibrium." He is hopeful of still further progress, as he thinks it is probably an affair of time and practice.

Hugo Magnus, of Breslau, has expanded this idea of time and practice into a learned and ingenious argument for the evolution of the colour sense. His conclusions are that "in the primitive period man possessed only the sense of light, that of colour being entirely absent. The sense of colour was produced by gradual development from that of light; colours were perceived sooner in proportion to their luminous intensity: thus, in the order of time, red was the first colour, and violet the last recognized and characterized as such. And it is not impossible that

our descendants may acquire the perception of colours which still escape the present generation."

Lastly, Mr. Gladstone, stimulated by the writings of Magnus, and "forgetting, for the moment, Turks, Russians, and Bulgarians," has published an article in the *Nineteenth Century* fully adopting these views, and he brought the force of his great classical learning to prove that the Homeric age had not advanced much beyond the red and yellow stage of chromatic evolution.

We have seen only an abstract of Magnus's work, and have not learned how he disposes of an obvious difficulty in the fact that some of the lower animals are undoubtedly possessed of a more or less developed colour sense. G. C. H.

ART. XXVI.—*Illustrations of Clinical Surgery*. By JONATHAN HUTCHINSON, F.R.C.S., etc. Fasciculi IX. and X. Folio, pp. 193-244. Philadelphia: Lindsay & Blakiston, 1878.

THESE two parts complete Mr. Hutchinson's first volume, and in giving an analysis of their contents, we finish a pretty full review of the additions this book has made to surgical literature. The reputation of the senior surgeon to the London Hospital is too firmly established to depend altogether upon the reception which this, his latest work, will receive at the hands of the profession. We therefore, acknowledging the work of a masterly hand in its construction, would simply call the attention of the reader to the contents of the book.

Plate XXXII. comprises three figures. The first and third represent instances of extensive depressed fractures which occurred some years ago, and resulted fatally. Mr. Hutchinson thinks that the injury to the cerebral substance was too extensive to admit of much hope from the use of the trephine, yet regrets that a resort was not had to it, as affording the only chance of recovery. In this retrospective prognosis (if the bull may be permitted), he clearly indicates the tendency existing among surgeons to reconsider their attitude of opposition to the operation of trephining, which came in a few years since, and their present inclination to adopt, in a modified degree, the practice of the surgeons of a century ago.

Figure 2 is of much interest, representing as it does a linear fracture which ultimately led to diffuse meningitis with its attendant symptoms. Here the trephine was used late in the case; but, as is most commonly the case, the matter being not confined, no relief was afforded by the step. The case is a good illustration of the progressive infiltration of bone which so often follows upon injury of its structure. It occurred out of the wards of a hospital, and therefore goes to show that such results cannot justly be limited to the effects of hospitalism.

Plate XXXIII. consists of two illustrations of post-mortem perforations of the skull.

Plate XXXIV. represents the appearance of the eye in vaso-motor paralysis, and the difference between the paralyzed pupil when seen in shadow and when brightly illuminated. The letterpress accompanying the illustrations contains a full account of two cases observed by Mr. Hutchinson, in which the cervical sympathetic was injured. The plates are accurately executed, but beyond the very evident paralysis of the pupil of the wounded side, it requires a close examination to distinguish between the sound and injured one. It is impossible

to enter into this somewhat intricate subject in this place, and we must refer those of our readers who are interested in it to the work itself.

Plate XXXV. carries us back to compression of the brain, and furnishes a most remarkable illustration of a pure and uncomplicated case of that injury, which went on to a fatal issue, unsuspected, and therefore without any attempt at its relief. The case was one of long standing caries of the cranium, without syphilitic history. A sinus discharging greenish pus led down to the bone immediately over the sagittal suture, and violent headache was a constant symptom. Without any paralysis the patient gradually became unconscious, and after one or two convulsive seizures died, apparently from exhaustion. Upon examination, between the calvarium and dura mater, there were found from six to eight ounces of pus. There was no meningitis, the arachnoid being unclouded, and the convolutions of the brain looked as if they had simply been pushed down and compressed by the fist. None of the symptoms commonly described as accompanying compression, such as laboured pulse, stertorous respiration, and stupor, were present, and the case goes far to prove how great an amount of mechanical compression can be endured by the brain, especially if the compression is gradually developed. Mr. Hutchinson thinks the persistent headache can be best accounted for by the gradual separation of the dura mater from its overlying bone. He also thinks that the case confirms the view that hemiplegia is rarely, if ever, an attendant upon pure compression of the brain, and that, if we only diagnose that condition to exist when the generally described symptoms are present, we shall fail to recognize many cases.

Passing on to the next fasciculus, we find in Plates XXXVI. and XXXVII. illustrations of phlebitis and pyæmia, and osteitis and pyæmia. While these are not new they are interesting, and show as well the nature of the complications which recent researches have proved to be causes of pyæmia, as the results which we now know have their origin in those causes. In the remarks which accompany these plates, Mr. Hutchinson goes into a discussion of the theories of pyæmia held by different authorities, and announces his unfaltering adherence to the theory which recognizes phlebitis, with its accompanying obstructions, as the principal cause of pyæmia.

The remaining two plates are uncoloured lithographs, representing bullet perforations of the skull, some received during life, others inflicted after death.

An appendix, giving further details of some of the cases pictured in the book, and defending in at least one case the originality of the author's observation, completes this beautiful volume.

The opinion of the reviewer has been fully expressed in the successive notices by which he has sought to make this volume known to the profession. It is enough now to say that the anticipations awakened by the first fasciculus have been fully realized, and that each succeeding part has only confirmed the impression that Mr. Hutchinson's work was destined to take a high place among recent contributions to surgical literature.

It is pleasant to know that the demand for this necessarily expensive publication has so far exceeded the expectations of its author, that he is sufficiently encouraged to promise its continuance in a second volume.

S. A.

ART. XXVII.—*Atlas of Skin Diseases*. By LOUIS A. DUHRING, M.D., Professor of Skin Diseases in the Hospital of the University of Pennsylvania, Physician to the Dispensary for Skin Diseases, Philadelphia, etc. Part III. Philadelphia: J. B. Lippincott & Co., 1878.

THIS part of the *Atlas* more than sustains the high reputation so deservedly established by the preceding numbers. The artist's work has even gained in refinement of colouring and delicacy of drawing, so that it would be hard to say in what respect it could be improved. Indeed, it may be stated without boasting that no plates recently published anywhere of similar character equal these in excellence at all points. Such perfection has only been attained, of course, by the constant supervision of the author at every stage, and but few can appreciate the time which he has bestowed upon this part of the work.

The selection of cases for illustration, as before, has been judicious, so that characteristic types of well-marked phases of the most important affections have been presented. They are eczema (squamosum), purpura, syphiloderma (erythematosum), and syphiloderma (papulosum et pustulosum). The text, which accompanies each of the plates, contains a short clinical history of the case represented, a description of the appearances at the time its portrait was painted, concise remarks upon the etiology of the affection and its relations to other stages and varieties of the disease, important instruction concerning points of differential diagnosis, and directions for the treatment of similar cases. To those familiar with the admirable text-book of Dr. Duhring it may be unnecessary to speak of the practical character of the teaching thus furnished; it forms no small part of the great value of the work. As the lithographic drawings will be destroyed after the printing of the present limited edition, we would advise our readers not to neglect such an opportunity of obtaining illustrations of skin diseases as will scarcely occur again.

J. C. W.

ART. XXVIII.—*Injuries of the Eye, and their Medico-Legal Aspect*. By FERDINAND VON ARLT, M.D., Professor of Ophthalmology in the University of Vienna, Austria. Translated, with the permission of the Author, by CHAS. S. TURNBULL, M.D., Surgeon to Eye and Ear Department, Howard Hospital, etc. 12mo. pp. 198. Philadelphia: Claxton, Remsen & Haffelfinger, 1878.

ANYTHING from the pen of Professor von Arlt comes to us stamped with the seal of authority, and therefore the first appearance of these papers in the *Wiener Medicinische Wochenschrift* met with a ready acceptance from all classes of medical men. It is true that to the ophthalmologist there is little new in the book, but its publication puts into the hand of the general practitioner a valuable little work, by an acknowledged expert, upon a subject of which he himself is either comparatively or entirely ignorant. Monographs, in book form, upon injuries of the eye are very few in number, the most important being those of W. Cooper, and Zander and Geissler, and one by Lawson, treating more especially of railroad injuries. The two former are antiquated, and the third is limited in scope, and not very recent. Hence this little book of Von Arlt, though consisting of only two hundred pages, fills a space that was empty, particularly on the medico-legal side of the question. It may happen to any physician to be called upon to testify upon the amount of injury done to an eye, and,

if he is not conversant with the specialty in question, his testimony is valueless. The author presupposes that the physician is acquainted with the modern means of investigation, including the use of the ophthalmoscope, and gives the very sound advice that if he does not possess these requirements, he should transfer the case into the hands of some colleague who is familiar with them. He deprecates the little value of many medico-legal opinions, in which the existing degree of vision and its changes receive no mention.

The author discusses the subject briefly, but very clearly, under four heads: 1. Injuries produced by sudden compression or concussion of the eye. 2. Injuries produced by the entrance of a foreign body, not acting chemically. 3. Scalds and corrosions of the eyeball. 4. Affections that are either feigned or produced artificially and intentionally. Of these four classes the most important is the second, as in these cases the foreign body may be lodged in the eye, or at either side, or behind it, or it may not remain at all. Injuries of the appendages of the eyeball are not considered. The author further justly emphasizes the necessity of examining the functions of the uninjured as well as the injured eye, for the latter may have been the one on which the patient relied to carry on his work, and if sympathetic inflammation should threaten the other eye, it is of great advantage to have noted the degree of vision of this eye at the time of injury. Another reason for a careful examination is the fact that abnormalities are sometimes found which existed without the patient's knowledge previous to the injury.

The author, in speaking of concussion, takes occasion to differ with Berlin as to the cause of the changes occurring at a point opposite the seat of the blow; and with Knapp on the subject of *contrecoup*. His explanation of rupture of the choroid is rational, and is in consonance with the views of other authors of note. In each division of the subject, the injury done to each and every part of the eye is considered separately, and afterwards the injury to the eye as a whole. In this way we obtain a very complete view of the entire field. The paragraphs on injury of the zonula of the lens are exceedingly good, and attention is called to the fact that a trembling or undulation of the iris is of no positive value as a proof of a movable lens, for the iris may oscillate independently when its pupillary margin is free, and there is more aqueous humour behind it than is normally found there. Wounds of the cornea, with prolapse of the iris and cystoid or ectatic cicatrices, form an important part of the second division of the volume, and are carefully considered. Wounds of the lens close the first part of the second division; and the second part is devoted to wounds where the foreign body remains behind. This is by far the most important part of the entire subject of injuries, for a decided opinion upon such a case is often not possible until after prolonged observation. Furthermore, after deciding upon the presence and situation of a foreign body, the question of removal should always be considered, not only as to its possibility, but as to its advisability. Arlt thinks that in doubtful recent cases, which can be kept under observation, it is well to wait a few days before interfering; but he also believes that the general rule, that foreign bodies should be rather removed early than late, must be borne in mind. In this, as in other branches of surgery, experience has taught us that strict abstract rules for action cannot be laid down for all cases, but that each case will inevitably modify such rules. The difficulties of the situation are drawn very clearly before our eyes by the author, and, as far as is possible in such a small work, discussed very fully. In fact, Professor Von Arlt, in the preface, states that he regards what he has here written as mere outlines, which he thinks might serve as a basis for a strictly technical and exhaustive monograph upon the subject.

So much for the work itself, and we will now turn to the translation. As a

whole the work of the translator has been fairly carried out, but there are a great many blemishes. The most glaring of these we meet with before opening the book. On the back of the little volume we read, "Injuries of the Eye—Turn-bull"!! In other words, the author is entirely ignored, and the translator glorified. This is certainly a very imprudent piece of assumption, to call it by no stronger name. The title-page is correct, which renders the matter worse. There are a few typographical errors, but the work of revision has been very carelessly done, and there are a number of places where the translation is too literal. Thus, on page 36, "resolution of the nidus of accumulation" may be German, but is certainly not pure English. There are instances of tautology, as on page 51, in "maculous spots." On page 79 another literal German phrase is "refusal of the pupil against atropine;" but this is not English. Such words as "reflectory" and "radiatory," though perhaps intelligible, are not good English, but manufactured. Foreign words are introduced which are to many unintelligible, such as "serrae" on page 102, and "encheireses" on page 123. There is a very careless piece of work at the bottom of page 114, in the last sentence, and one of the most awkward translations occurs on page 122, in the words "to endeavour an exhaustion of the lens." Chapters III. and IV. are, however, very carefully translated, and read very smoothly; and the book is a valuable contribution to medical literature in spite of these blemishes. C. S. B.

ART. XXIX.—*A Practical Treatise on Aural Surgery.* By H. MACNAUGHTON JONES, M.D., etc., Surgeon to the Cork Ophthalmic and Aural Hospital, etc. etc. 8vo. pp. 174. London: J. & A. Churchill, 1878.

THIS book is written by an author evidently interested in otology, and deserves credit for some well-written parts, as, for instance, those pertaining to the management of the Eustachian catheter, the treatment of chronic suppurative inflammation of the middle ear, and the short chapter on Othæmatoma. These portions of the little work are quite good. But no book on the ear is worth publishing without more anatomy than this book contains. Then, too, there should appear in a book, even of the small size of this one, a more complete description of the appearance of the membrana tympani both in health and in disease. Instead, however, of some hints on these two latter and important topics, the author launches his reader into what might be very justly called a pictorial catalogue of instruments. It is true that the pictures are prettily drawn, but most of them are of useless instruments, and many of them unknown to scientific otology. The whole number of wood-cuts in the book, 45, are of some kind of instrument. The book appears to have been written hurriedly, and without much collateral reading, as is shown in the paucity of references. Otology is not confined to any one land or book; it is purely catholic in this respect. That the book is written hurriedly is also evident from the numerous typographical errors and ambiguous phrases which mar its pages.

When giving directions for syringing the ear, the author tells his reader that "the lobe should be held well back" (p. 108). Such a procedure would be useless to the surgeon, and painful to the patient, especially if there should be a fissure between the lobe and the cheek. The general direction to draw the auricle upward and backward by gentle traction on the helix would have been the proper advice. On the same page, 108, a description of what the author terms inflammation of the membrana tympani is given, but in which it is not easy to recog-

nize anything but a typical case of otitis media purulenta. So that here again confusion must fill the mind of the reader.

Our faith is a little shaken either in the power of observation, or in the knowledge, or in both, of the author, from a statement which appears on p. 33, to the effect that the so-called "pyramid of light, on the membrana tympani, is situated where the *short process* terminates." Now, if there is any one point on which anatomists are clearly in unison, it is that this peculiar reflection of light is seen at the end of the manubrium, or *long process* of the malleus. In fact, it cannot be anywhere else. The description of the light spot, however, is good, with this exception respecting its position. But we must urge accuracy in these matters, as in all matters of diagnosis. On p. 92 occurs the compound word "corto-labyrinth,"—the "middle corto-labyrinth." Now, as this word is unknown to otology, and as there is no explanation of its meaning in the author's text, great obscurity surrounds it.

On p. 39, Politzer's bag, as modified by Allen, of London, is lauded; but it may be no more than fair to say that this modification has never been accepted by Prof. Politzer, simply because he considers the nose-pad, as suggested in this modification, as dirty—a view in which the reviewer heartily coincides. The statement, on p. 40, that "with Politzer's bag we can diagnose any perforation of the membrane," etc., should contain the important proviso, *if the Eustachian tube is pervious to air*.

On p. 46 it is stated that hearing the tuning-fork vibrating on the vertex better in the deafer ear warrants the presumption that there is mucus in the tympanum. The manner in which the tuning-fork is heard would not of itself warrant such a presumption, for an ordinary chronic catarrhal process without mucus in the ear gives the same response to the tuning-fork. But this is plain enough if the one fact is kept in mind that whatever impedes the entrance of sound to the ear also impedes its exit. Not only mucus in the tympanum does this, but so does the ordinary altered condition of the sound-conducting parts in a middle ear affected with chronic catarrh.

We are astounded at the author's statements respecting the use of the Eustachian catheter in a sensitive nostril. On pp. 59, 60, it is said that "in some persons, where the nostril is sensitive, tender, or obstructed, I find it useful to pass a soft bulbous bougie, well oiled, once or twice before introducing the catheter." We are to understand, then, that when the nostril is too tender to permit the entrance of the *slender* catheter, we can make matters better by inserting a *bulbous* bougie into the sensitive passage. We regret that our author advocates the surgeon's blowing his breath into the patient's middle ear by means of the Eustachian catheter, as it is certainly a very inelegant, inconvenient, and needless procedure. In some cases we would consider it indelicate.

Chapter VIII., tenotomy of the tensor tympani (pp. 83–95), is chiefly quoted from Weber-Liel and Hartman; but the author seems ignorant of the labours of Gruber and J. Orne Green in connection with this operation. Yet in a book of this size why quote a dozen pages on a questionable operation, and call the whole a chapter?

Our author advocates the use of 10 to 20 gr. solutions of nitrate of silver in otorrhœa. Silver solutions of this strength have long since been abandoned by aurists, especially since Schwartze demonstrated their futility and the great advantage of using stronger ones. It is a common thing for aurists to use nitrate of silver in solution of a strength varying anywhere from 50 to 480 grs. to the fluid-ounce of water. It is in fact admitted, by all aurists of any degree of authority, that it is worse than useless to employ weak solutions of silver in the ear.

The general advice respecting the employment of the artificial membrana tym-

pani is very good ; but when the author alludes to the pulsation always seen in any ear where fluid is, and lays great stress on the diagnostic value of this appearance, we must say that, although where such pulsation is a perforation may be, it by no means proves that a perforation exists in the membrane. Pulsation means nothing in this respect, as can be shown by putting a drop or two of water in the fundus of the auditory canal when the membrana tympani is intact. The pulsation of the heart is always communicated to a column of fluid in an auditory canal, whether perforation exists or not.

We do not desire to be hypercritical, but in the present day some inherent evidence of research, originality, or literary skill, and, if possible, of all of these essentials, is demanded of every new book. Yet we fail to see in this any more than that which must be deplored in a host of works on all subjects in the present day, viz., that the subject has been abused in the house of its would-be friends. It is, in fact, impossible to see wherein otology or general surgery can be benefited by such a book as the one whose title heads this notice. C. H. B.

ART. XXX.—*Insanity in Ancient and Modern Life, with Chapters on its Prevention.* By DANIEL HACK TUKE, M.D., F.R.C.P. 12mo., pp. 226. London: Macmillan & Co., 1878.

A WORK like this, embodying the matured conclusions of thoughtful study and extensive personal observation, free from dogmatism and exaggeration, from sensational statements and vicious logic, is always welcome. It is welcome, not only for its own intrinsic merits, but because the disease of which it treats is medically, legally, morally, and socially, of immense and growing interest in every civilized community. So much has appeared on this subject abounding in pernicious errors, that the value of a good book like this can scarcely be overestimated. Most diseases are regarded as belonging exclusively to the domain of the physician, whose special possession is disputed only by the quack and charlatan. The idea of popularizing medical knowledge has never been strongly favoured by the profession, for it is a question whether any expected benefit from the process is not more than balanced by the effect of a too curious introspection into our physical condition. Whatever doubt may exist on this point, generally considered, it must be admitted that in regard to mental disease popular information is rendered highly desirable on account of the very numerous and peculiar interests which it involves. It is not solely the health of an individual that is concerned, but also the health and welfare of his offspring, the cause of humanity, the good order of society, and the character of our legislation and jurisprudence in dealing with it. Whoever, therefore, helps to enlighten the public respecting insanity is a public benefactor, especially when it is done so judiciously as it is in the book before us. The need of such instruction is becoming more and more pressing every day. Most people think they know something about insanity. They often know better than the doctor what should be done with the patient. They are profoundly knowing as to the causes which produced the trouble. In courts of justice they are ready to say with more than the confidence of an expert whether the person concerned was or was not insane. Many of them, though very likely never in a hospital except as casual visitors, undertake to inform the public, in papers read to associations bent on reforming the world, how the patients in those institutions should be managed. And when a hospital is to be established, who but them are competent to adopt the plans, to draw the specifications, and make

the contracts?—for are not the veterans in the specialty, the men who have spent their lives in the care of the insane, little better than old fogies, running, year after year, in the same old ruts? Surely these things show some need of popular enlightenment respecting insanity and the insane.

Dr. Tuke believes that of late insanity has been steadily increasing, and this, we apprehend, is now the dominant opinion among those who have given much attention to the subject. He regards the disease as chiefly one of the products of civilization, which, with all its benefits to the bodily and mental health of the race, has introduced habits, practices, and appetites greatly prejudicial to both. As such agencies have always existed, in a greater or less degree, among all races making any pretensions to civilization, he seeks for a confirmation of his opinion in the historical records of those best known to us. Rich in his stores of ancient learning, he finds in them ample proof among the Jews, the Egyptians, the Greeks and Romans, of the existence of those agencies most effective in the production of insanity,—intoxication, defective nourishment, strong moral emotions, and intellectual strain. Though far less prevalent and active than in modern times, there is no reason to doubt that they had their legitimate effect in impairing the mental energies.

The exigencies of modern times have led to a great enlargement of these noxious agencies, for the extremes of wealth and poverty, the moral and intellectual strain in the perpetual struggle for existence, the facilities for indulging the coarsest appetites and passions, have multiplied and strengthened them to an extent unknown in ancient times. They act both as predisposing and exciting causes of insanity; in the former relation, vitiating the quality of the brain, and in the latter developing this impairment into overt insanity in a succeeding generation. The drinking man who passes along till the day of his death without appreciably failing in health or strength, the life-long victim of misfortune and poverty battling with adversity to the last, the merchant, the banker, the politician struggling for the prizes of life under the varying emotions produced by the chances of success or failure, without utterly breaking down,—each and all may transmit a heritage of cerebral infirmity waiting only a fitting opportunity to be transformed into actual disease. Our social conditions, it must be remembered, with all their conservative influences, abound with occasions of cerebral deterioration even in the opening years of life. Especially are those industrial employments that bring together the old and the young—men with grovelling tastes and degrading habits, and boys apt and eager to learn in the only school within their reach—sources of incalculable mischief in that direction. “It was recently observed by Mr. Mundella,” says Dr. Tuke, “that the lad who began at eight years of age in a mine, without education, and who was associated with men whose whole ambition was a gallon of beer and a bulldog, was not likely to grow up to be a Christian and a gentleman.” Such influences continued through successive generations must leave their mark on the vital statistics of the race. Looking into a higher social stratum, we see a youth pursuing his education for years under a dangerous strain of his mental forces, and then embarking in a business career that tries his powers of endurance by its rapid alternations of hope and fear, of failure and success. Are we surprised by the steadily increasing returns in the tables of mortality, of apoplexy, paralysis, and cerebral congestion? Competition, which is the animating principle of this our modern life, looks askance at prudence, moderation, and rest, and makes no provision for reserved force. “The great drawback and great misfortune in the public life of public men at the present day,” says Mr. Gladstone, as quoted by Dr. Tuke, “is that which I may describe by the word *excess*.” Had he embraced in this category

all other classes of men who live by their wits, the remark would not have been far from the truth.

And how shall the man afflicted with the ancestral taint prevent its fearful development into actual and active disease? Alas, the answer implies an appeal to a kind of reason and forecast that, for the most part, has but a loose and uncertain control over the conduct of men. If we were expecting, near at hand, the visitation of some deadly zymotic, and if high authorities had proclaimed the curative properties of a certain drug, experience tells us there would be a rush upon the shops which sell it, until it were swept from the market. In the case before us, however, we meet with the incredulity and disgust of the ancient king when directed, for the cure of his malady, to a remedy destitute of every element of the strange and marvellous. In answer to the question, Dr. Tuke can find nothing better for the text to his discourse than the advice of the school of Salerno to those in need of a physician, viz., a cheerful mind, rest, and a moderate diet. And the sermon needs to be scarcely less brief than the text; for when, aided by all the lights of modern observation, we have said to our seeker, avoid all employments that encroach upon the ordinary periods of rest, and those, too, that involve an amount of trial and responsibility beyond your powers of endurance, engage in no undertakings likely to produce apprehension and anxiety, shun those scenes and occasions where the emotions are wrought up to a high pitch of excitement, be on your guard against any strain, moral or intellectual, have we not said everything that can be turned to any practical account? Nothing here said, however, need discourage the reader from well pondering the suggestions of Dr. Tuke.

I. R.

ART. XXXI.—*Montreal General Hospital: Pathological Report for the Year ending May 1, 1877.* By WILLIAM OSLER, M.D. 8vo. pp. 97. Montreal, 1878.

THE first pathological report from a Canadian hospital, as this modest, unpretentious volume is declared to be in the dedication, is one not unworthy of its source. To the autopsies made under the editor's supervision in the hospital, are added a few cases of special interest from private practice.

The notes of cases are concise, often too brief to be satisfying to the student of histology; in fact, very few microscopic examinations are given. For instance, in Case LXXXII., of cancer of the brain, lungs, liver, and vertebral bodies, the statement that the growth was cancerous dismisses the consideration. Whether or not this was established by microscopic examination does not appear; certainly such a study would have greatly added to the interest and value of the report. It would also have greatly increased its importance from a physiological, and, indeed, a diagnostic point of view, if a brief mention had been made of the effects, during life, resulting from a growth occupying the superior parietal convolution of the right side, accompanied by small masses in the right corpus striatum and in the left thalamus opticus. This omission is the more noticeable from the fact that such clinical information has been supplied in some of the other cases reported.

It would also be interesting to know the histological character of certain secondary growths in the liver, which were found in a fatal case of epithelioma of the tongue (Case XLII.); since these secondary growths in this situation are usually sarcomatous; but it is acknowledged that epithelial cancer may also occur in the liver, where there are, strictly speaking, no ordinary epithelial elements.

As most of the interesting cases have already appeared in the medical journals,

present analysis of them is unnecessary. The interesting case (LIII.) of aneurism of the hepatic artery (a cut of which is given as the frontispiece of this volume), reported by Dr. Ross in the *Canada Med. and Surg. Journal* for July, 1877, has been already brought to the notice of the readers of the *American Journal*.¹

We notice, on page 16, a case (XLIV.) of hypertrophy and dilatation of the heart, without valve lesion, although the patient had all the symptoms of chronic valvular disease and a systolic murmur to the left of the sternum at the third interspace. The cardiac trouble was by exclusion decided to be one of that comparatively rare form, first pointed out by Prof. Da Costa,² where strain and overaction from prolonged muscular exertion lead to organic disease.

In twenty per cent. of the cases examined, fenestration of the aortic valves existed, but in only seven per cent. of the pulmonary semilunar. These peculiar little perforations are believed to be either congenital, or result from atrophy, and generally have little pathological significance. The proportion here given is largely in excess of ordinary observation; but it is nevertheless remarkable that they so rarely give any signs during life, or lead to serious cardiac disease.

A death from the rupture of an aneurismal dilatation of a branch of the pulmonary artery in the wall of a phthisical cavity is reported (Case XLVIII.), with the observation that the rupture of such small aneurisms is the cause of hemorrhage in most of the cases of death from hæmoptysis in chronic phthisis.³

In connection with acute pneumonia there is a case of death from intercurrent meningitis (Case X.), and one (Case XV.) of red hepatization associated with extensive *diphtheritic colitis*. Dr. Bristowe⁴ has already called attention to this latter condition, which he found in two out of thirty cases of secondary pneumonia, and in five of sixteen cases of the primary disease.

Two cases of pernicious anemia of the myelogenous variety are given. Of these one was published in the *Transactions of the Canada Medical Association*⁵ for 1877; the other in the *Canada Med. and Surg. Journal* for March, 1877. The study of these cases has been carefully conducted, and the reports are valuable contributions to pathology. As an instance, however, of the fact that hyperplasia of the bone-marrow does not constitute the disease, being not uncommonly found in other chronic wasting diseases, we notice that in Case VII. (a man æt. 35, where there was pulmonary tuberculosis, death occurring from acute tubercular peritonitis), there was found to be a general hyperplasia of the bone-marrow. Through some oversight, the condition of the blood as regards its relative richness in cells is not mentioned; but the following is communicated in reference to the medulla of the bones:—

“That of the long bones has a uniform grayish-red colour, nowhere having the yellowish, fatty aspect of normal marrow. In the cancellated portions, and short bones, it has a lighter red colour. On examination, there were: (1) Red blood-corpuscles, presenting considerable differences in size, some hardly the $\frac{1}{5000}$ ” in diameter, and many curiously irregular in form. (2) Ordinary marrow-cells and lymphoid corpuscles, which, together with the blood-corpuscles, constitute the chief mass of the tissue. (3) Nucleated, red blood-corpuscles, the embryonal or transitional forms of Neumann, of which in each specimen examined four or five examples were met; they are larger than the ordinary coloured forms, and have usually a single nucleus. The coloration of these corpuscles is nearly, if not

¹ For Oct. 1877, p. 565.

² Confirmed by the observations of Allbutt, Meyers, Seitz, Thurn, and others.

³ See Ramussen, *Edinburgh Med. Journal* for 1868; and Powell, *Transactions London Pathological Society*, vol. xxii.

⁴ *Transactions Pathological Society of London*, vol. viii.

⁵ Noticed on page 506 of this *Journal* for April, 1878.

quite, as marked as in the ordinary forms. (4) Cells containing red blood-corpuscles, of which a few examples occurred. There are no *myéloplaques*."

An instance of the rare condition of hypertrophic cirrhosis of the liver (Case I.) in a drunkard is given on page 56, with microscopic appearances; one (Case LXXXIV.) of cancer of the neck of the gall-bladder, with gall-stones; and a case (LXXXVIII.) of suppuration of the portal vein following typhoid fever, also are worthy of attention.

The editor has evidently given much care to the compilation and arrangement of this work; and is to be complimented upon the clear style of the reports, and the unusual freedom from typographical errors which so frequently disfigure works of this kind and detract so greatly from the pleasure of reading them. It is to be hoped that these pathological reports of the Montreal General Hospital will continue to be published, so as to preserve the records of cases of such unusual interest as appear in the first volume of the series. F. W.

ART. XXXII.—*Mortuary Experience of the Mutual Life Insurance Company of New York, with Tabulated Reports, and an Analysis of the Causes of Death.* By G. S. WINSTON, M.D., W. R. GILLETTE, M.D., and E. J. MARSH, M.D. Vol. II. 8vo. pp. 224. New York, 1877.

THIS work is a continuation of the one which we noticed in the number of this Journal for July, 1876. It deals much less with numerical facts, and more with general deductions from the experience of the company, as bearing on particular diseases. A large amount of space is devoted to consumption, with results extremely interesting, and, in some respects, surprising. One conclusion, somewhat at variance with the general impression, is, that the disease prevails with about equal frequency at all ages, from twenty to sixty years. Above the latter age, it even increases as a cause of death. In the especial field of the insured lives, the fatality more nearly approaches to the popular idea; apparently from the fact that tendency to the disease is much less discoverable in the young than in the middle-aged. That is, a young person not unfrequently passes rather suddenly from apparent health into a phthisical condition; while with older people the onset of the complaint is more gradual and more forewarned, so to speak. The latter class of cases, therefore, are detected and refused as risks by the medical examiners, while the former are accepted, and develop their malady later.

As to the alleged increased proportionate prevalence of phthisis as a cause of death after sixty years of age, we would suggest that many old people have a chronic bronchitic cough, and, dying from general debility or old age, the disease may be wrongfully attributed to "consumption."

The protective influence in favour of the company, exerted by its medical examinations, is shown in regard to this disease by the fact that, whereas in society at large phthisis destroys annually 35 out of 10,000 adults living, within the circle of the insured the number is only about 19. The effect of rigid examination is again shown in the small number of phthisical deaths in the first year of insurance. Thus, to 10,000 lives exposed, but 7 die in the first year, while 17, 21, and 25 to each of the succeeding three years mark the development of disease, undiscovered, and probably undiscoverable, at date of application.

The officers of the company have been unable to reach any conclusions as to the influence of occupations upon phthisis.

Chest-measure, while found to be somewhat less in consumptively inclined per-

sons than in others, is here regarded as an indication of less prognostic moment than is the weight of the body, in its proportion to the stature. Careful observations of large numbers of men (among them the U. S. Provost Marshal's observations noticed in this *Journal* for Oct. 1876) have established a standard of normal ratios whereby the weight of body, proper to each height, is ascertained. Among consumptives, we are here told, 80 per cent. fell below the right weight.

Hereditary predisposition, or "family taint," has not seemed to these writers worthy to exert quite so strong a prohibitory influence, as might have been anticipated, against the taking of risks. By itself alone, it is not considered decisive against acceptance. They have not found the disease earlier developed in the tainted than in those free from known predisposition.

Hæmoptysis, it would strike an outsider, is here a little overrated as condemnatory of an application. The company accepts no one within seven years after manifesting this symptom.

Zymotic diseases have a peculiar importance to insurance companies, inasmuch as no care in selection can avail to guard against losses, and as the causes which produce epidemics are wholly beyond their control. Some forms of zymotic disease, however, but rarely attack the class of people who insure their lives. Hence we see that, while typhoid prevails equally among the insured and among the general city population, smallpox is at 7 to 48,¹ as cause of death in these two classes; typhus fever, 5 to 20; dysentery and diarrhoea, 24 to 67; and relapsing fever caused no deaths in the company's 100,000 risks. Altogether, the zymotic mortality in the company is about one-half that outside. Conditions of age, and the fact noticed in the foot-note, of course aid in producing this great difference, which, however, seems yet to be chiefly due to the difference of class, as first referred to.

The apparent fact of a company-mortality from alcoholism of 6 against a general rate of 68, here attributed to the influence of careful selection of risks, we are inclined to discount considerably. The unpleasant word in question is rarely used, however appropriate, in the social class to which the company's clients mostly belong. Every medical man knows how very many terms may be employed in these cases, and often justified more or less by the symptoms, to avoid naming the ugly condition at the back and bottom of all the surface symptoms. Indeed, it is almost impossible to disregard the feelings of surviving friends in this matter.

We notice, by the by, that our authors include the affection just named among the zymotics.

Tables of deaths by decennial periods support the statement, that care in selection of risks has no protective power against losses by zymotic diseases generally, inasmuch as the number in each period varies but little, and with no apparent law.

We are somewhat surprised to learn that the mortality from smallpox is much smaller than among the insured of the German companies, in the ratio of 2.3 to 10, in the most fatal years of each. The absolute number of decedents in the "Mutual" from this cause is too small to warrant much argument, but out of the company's 23 deaths, in 1871-3, 12 were foreigners, including 8 Germans.

Typhoid fever tables indicate that *deaths* from this disease are by no means proportionately less frequent in advanced life. In fact, to 100,000 lives in the age-period 60-69, there are just double the number of decedents from typhoid that are found from 30 to 39. The sequence of mortalities, through the periods as here shown, is rather curious. Beginning with 87, from 20 to 29, we find in suc-

¹ This difference is in part due to the municipal statistics covering fewer years, and yet including the worst period of epidemic prevalence.

cessive decades, 52, 54, 58, 104, 86. Thus the general chances of death from this malady seem greatest in age and in youth, while least in middle life. Are any other modes of ending, among the old and debilitated, possibly liable to be mistakenly reported as typhoid?

A very large and somewhat inexplicable disproportion seems to exist as to cancer, as a death-cause, in and out of the company. In the lack of a better, may we not suspect as a reason for exemption the better food and sanitary surroundings of the class that insures?

Diseases of the nervous system, as a cause of death, rapidly increase with the age of the insured. Comparing the insured with the uninsured, the mortality to a certain number living is decidedly smaller with the former. *Among the dying*, in the respective classes, however, those from nervous diseases bear, to the total mortality, a larger proportion among the insured—owing, probably, as here suggested, to the extensive exclusion of other forms of disease, such as consumption, for instance, by the company's examiners. That the actual proneness of the class which insures, to fatal nervous trouble, is less than that of a more stolid and less intellectual one, is an occasion for some comment. The present writers point to superior knowledge of laws of health, better food and shelter, and especially to more temperate habits as to drink, as the probable causes which overbalance the greater nervous tension and wear and tear resulting from the severe mental and emotional strain attending the lives of the professional man and the merchant.

Deaths by apoplexy are fewer, to persons living, among the insured than outside; in both classes the number very rapidly increases in about an equal ratio—doubling with every ten years of age.

The fact and comment of the previous publication are here repeated as to the greater mortality from apoplexy in the first year of insurance than in the second. Fears and warnings, more or less vague, perhaps, led persons to insure their lives without mentioning sensations that would have excluded them if named. The peculiarity as to the first years obtains in all the decennial periods.

Some curious and interesting researches have been made to ascertain whether or not some recent writers are right in setting aside the idea that a stout and short stature favours apoplectic seizures. The company's experience decidedly supports the more popular and time-honoured notion.

In regard to "softening of the brain," we think the compilers might wisely have pursued the same course as with "disease of brain"—dismissed the matter as too vague to be recognized as an entity. We mean, of course, the manner in which the term is ordinarily applied—to any and every case of progressive mental weakness.

Appos to the question of insanity and suicide, noticed on another page of this Journal, we find here the significant fact that of the 70 decedents from "insanity," 39 committed suicide! Even supposing that other deaths should properly have been attributed to insanity—instead of "brain disease," or some intercurrent or terminal malady—this extraordinary proportion speaks in trumpet-tones of the peculiar weakness (*we* cannot call it belief) of juries, which seem to have no other term which they can possibly apply to suicide than those sapient words, "temporary insanity." How they arrive at a knowledge of its temporary character we cannot imagine, unless because the victim passes from time to eternity.

The very decided proportional infrequency of mortality from heart-disease, which exists in the earlier years of insurance, gradually diminishes, though it never wholly disappears. That is, among persons who grow old in the company the affection becomes more and more prevalent. And its frequency increases with age, even in those recently insured.

A somewhat remarkable disproportion exists between the general and the com-

pany mortality from pneumonia. Partly to selection, but especially to exemption from poverty, hardship, and intemperance, is attributed the fact that deaths from pneumonia among the insured are only from one-third to one-half the number, to so many persons living, that obtains in the general population of New York City.

It is a sign of honest purpose and a right spirit to make here one or two acknowledgments of erroneous deductions in the previous publication. The supposed excess of casualties among the young as compared to elder people, formerly charged to activity of life and recklessness of spirit, is now stated to be apparent rather than real, arising from the absence of many other death-causes proper to more advanced life. The interpretation of figures is a very difficult art, and the acknowledgment of error in particulars increases our faith in the general correctness of the work.

In connection with the statements regarding insanity, above noticed, we may remark that the total number of deaths by suicide was 62; so that there were actually 23 *not* adjudged to be manifestations of insanity.

We have far from exhausted the interest and value of this volume, and can only hope we have not misinterpreted its teachings. B. L. R.

ART. XXXIII.—*On the Use of Wines in Health and Disease.* By FRANCE E. ANSTIE, M.D., F.R.C.P. 12mo. pp. 74. London: Macmillan & Co. 1877.

ALL the writings of the late Dr. Anstie form instructive and interesting reading, and the little *brochure* before us is no exception to this rule. As indicated in the title, the work is divided into two parts: in the first, on the use of wine in health, without discussing the lawfulness or advisability of such use, the author adopts as a fact "established both by wide-spread custom and by the most recent physiological research, that alcohol, as such, has its legitimate place in the sustentation both of the healthy and diseased organism." He shows, however, that wines, in addition to being first and more especially considered as alcoholic fluids, contain various other ingredients, such as sugar, acids, salts, astringents, and the fixed and volatile ethers, scarcely less worthy of study in the selection of wines for ordinary use, and of particular value in their application to the treatment of disease. The second part is occupied with the consideration of the uses of wines in acute and chronic diseases, sound general principles being laid down to govern their use in the febrile and non-febrile diseases, severe hemorrhages, acute neuroses, shock; and, under the head of chronic diseases, in debility from failure of primary digestion; in defective conditions of the blood, such as anæmia, chlorosis, hydræmia, etc., not yet complicated with tissue change; in phthisis, and the wasting diseases of childhood; in the chronic neuroses of the aged; in exhausting mucous discharges, and in chronic suppuration. Here again the author shows the value of a familiar acquaintance with the different vinous ingredients, the practical application of which is well illustrated in the following passage:—

"The ethereal constituents of wine have a special value in the latter stage of severe febrile disease, with great exhaustion of the heart, especially when combined with sleeplessness. On the other hand, a low alcoholic strength of wine, together with the presence of carbonic acid, as in the finer effervescing wines, is particularly useful in cases where the violence of the fever, the nervous prostration, and the derangement of digestion, are out of proportion to the gravity of the case as regards danger to life and continuous destruction of tissue."

Finally, the book may be recommended as containing a great deal of information pleasantly imparted, of value not only to the practitioner, but to those who would be intelligent *wine connoisseurs*.
R. M. S.

ART. XXXIV.—*Prescription Writing, Designed for the Use of Medical Students who have never Studied Latin.* By FREDERIC HENRY GERRISH, M.D., Prof. of Materia Medica and Therapeutics in the Medical School of Maine, etc. Second edition, 16mo. pp. 51. Portland: Loring, Short & Harmon, 1878.

ANY attempt to give instruction in the important but much neglected art of prescription writing is worthy of encouragement, since there is no denying the fact that many students, partly from indolence, but chiefly from lack of opportunity, leave our schools utterly ignorant of this branch of practical medicine. The little volume before us is especially deserving of praise, both on account of its being an effort in the right direction and because it is very carefully and correctly written. It is divided into two sections, the first containing the rules for writing prescriptions, and the second a list of the words used in prescriptions. Every medical student should possess this book and make himself master of its contents; many practitioners, too, would profit by the directions in regard to chirography.
L. S.

ART. XXXV.—*Annual Report of the Board of Health of the City of Pittsburgh, for the Year 1877.* pp. 70. Pittsburgh, 1878.

WE find here reported a mortality from smallpox of 269, and from diphtheria of 401. Neglect of vaccination, principally among the most degraded and ignorant classes, is named as the cause of the first malady prevailing so extensively. When we learn that the total mortality was but 3408, from all causes, the fatality from diphtheria appears truly appalling. From this report, and from an article in a daily paper purporting to be an address before the Academy of Medicine by Dr. Snively of the Health Board, there appears to have been a close connection between insufficiently sloped, uncleansed, and unventilated sewers, and the locality of greatest mortality by diphtheria. And the commencement of excessive fatality closely followed a remarkably heavy rain falling in a few minutes: Several similarly violent showers followed within a few weeks. It is believed that sewer-gas, forced into houses at the time the sewers were inundated, caused the extraordinary number of cases and the scarcely less extraordinary concentration of the disease in certain districts. Previous to August, the disease may be considered to have been purely sporadic, judging both by number of cases and their distribution. Only 35 deaths occurred in the first seven months, while the mortality during the last five months reached the frightful total of 366. The annual death-rate from this cause, in previous years, had varied from fifty to eighty. There would seem to be no possible doubt that there existed some sort of connection between the epidemic and the obstructed or sluggish flow of sewage.

Curiously enough, typhoid continued to exhibit the gradual decrease of mortality which had existed for several years. A singularly large mortality by whooping-cough is not commented upon in the text of the report. 136 deaths from this cause are reported, against 24, 55, 79, and 57 in the consecutive years preceding. Scarletina did not prevail to any unusual degree.
B. L. R.

ART. XXXVI.—*Handbook of Ophthalmology*. By Prof. C. SCHWEIGGER, of the University of Berlin. Translated from the third German edition. By PORTER FARLEY, M.D., Rochester, N. Y. 8vo. pp. 555. Philadelphia: J. B. Lippincott & Co., 1878.

WE have here presented, for the first time, to the English reading public the well-known Handbook of Schweigger, of which the first edition in the original appeared in 1871. The preface which accompanied the first edition has been omitted, whether by the author or translator we have at present no means of deciding; but in either case we think it unfortunate, inasmuch as our author clearly states therein that his readers must bring with them the necessary knowledge of optics, anatomy, and physiology, and, furthermore, that he by no means expects to enable the student to dispense with attendance on clinical demonstrations and lectures. The book, therefore, calls for the most careful and attentive reading on the part of those not moderately well versed in the subjects of which it treats: and this is all the more necessary on account of the terse and condensed style of the author. Indeed we cannot read far without recognizing the same vigorous hand and trenchant style which we find in his *Lectures on the Use of the Ophthalmoscope* (1864).

Occasionally it seems to us the author's own enthusiasm and interest in special subjects have induced him to expand these to the detriment of others of more practical importance to the profession and to the public. Thus, when treating of strabismus, he has given us a most carefully elaborated discussion of the subject of the "suppression of retinal images" and of "identical retinal points," while he dismisses briefly the increasing prevalence of near-sightedness in schools and colleges; and, indeed, while quoting Cohn's first investigations on the subject, he omits all reference to the more recent statistics thereon.

At every turn, however, we recognize the careful practitioner and experienced observer, and the book fairly bristles with useful hints to those reading it carefully. Dr. Farley has done his part of the work well, and has given us a faithful reproduction of the original. W. F. N.

ART. XXXVII.—*Transactions of the Medical Society of the State of New York for the Year 1877*. 8vo. pp. 479. Albany, 1877.

THE large and handsome volume published by the New York Society has very little eloquence, but a large amount of practical observation, by practical men, and for practical use.

Prof. R. W. PEASE earnestly commends the treatment of urethral stricture by the methods and instruments employed by Dr. Otis. When the measurements are carefully made, and the strictural fibres completely divided, so as to restore the normal calibre, he asserts that the cure is speedy and permanent, without continued use of bougies. Forty-five cases are tabulated. These appear to support the claims made for the treatment.

Irido-choroiditis, apparently dependent on pyæmic infection after child-birth, is treated of by Dr. T. R. POOLEY. The one case here reported proved fatal.

Recovery from a puncturing wound, made by a jagged iron fragment, believed to have penetrated the liver, as well as the lung and diaphragm, is reported by Dr. PARMELEE. The eleventh rib was divided by the accident.

Two gentlemen report recoveries from very severe cranial fractures at the base. One case was a lad, the other a very young man. In one, serious loss of brain-substance and a fungous growth occurred. In the other were symptoms strongly pointing to injury of the connections between brain and cord. Furious delirium, as if from meningitis, appeared in this latter case. In the other patient, paralysis of the portio dura persisted, while affection of the vision and the ocular muscles had nearly disappeared at date of report. We presume neither reporter would very confidently assure the continued freedom of their patients from cerebral symptoms. As to the acute and immediate troubles, however, we may call them recoveries.

Dr. AUSTIN FLINT very ably exhibits the reasons which lead him to look upon pneumonia as a constitutional disease rather than a local; a specific fever rather than a circumscribed inflammatory lesion. *A priori*, it would be hard to say why there should not be a pneumonic fever as well as variolous, a scarlet, or an intestinal. Juergensen, Dr. W. H. Draper, and other eminent writers have advanced the same idea. The arguments, as here very briefly but forcibly put, seem to us almost conclusive, at least as to the presumptive truth of these recent views. From the notes given of the discussion which followed this paper, it would appear that the notion of pneumonia being "an essential fever," with "a characteristic lesion like smallpox or scarlet fever" (quoted from Draper, with approval), caused not a little commotion in the minds of the more conservative members. To consider lung fever the effort of nature to eliminate a blood-poison must certainly have suggested many reflections pregnant with consequences.

Dr. MARY P. JACOBI presents an admirable report of two instructive cases of masked epilepsy. The account very well illustrates—if the diagnosis was correct, as we believe—the obscure and hidden ways in which this terrible disease is sometimes manifested, or rather perhaps we should say, concealed.

Dr. MCFARLAND notices the increasing use of hypodermic opiate medication at the discretion, or indiscretion, of patients. It seems to us that he has not quite strongly enough indicated the peculiar and singular fascination which this mode of administration has for its devotees. He fully recognizes the fact, however, that the "opium habit" is sooner formed through the hypodermic than through stomacheic exhibition. Opium "antidotes," of late so much vaunted by circulars and other methods, are believed by him to be invariably composed of the "hair of the dog that bit" their unlucky dupes. A friend of his has collected twenty-eight different "opium cure" circulars. At least five of these are named as having been tested chemically, and found to contain opium.

Fatty embolism, as illustrated by a fatal case, is treated of by Dr. WM. H. BAILEY. A trivial flesh wound was followed by deposit of pus under the deep fasciæ of the thigh, great constitutional irritation, dyspnoea, delirium, and death. The blood was found loaded with fat-globules, and with considerable occlusion of capillaries in the lungs and liver, caused by the presence of these minute spheres.

Believing that the rage for novelty, in drugs as elsewhere, leads to frequent neglect of useful agents longer known, Dr. POMEROY, of Newark, directs attention to the virtues of muriate of ammonia as an alterative and neurotic. We are inclined to agree with him that the powers of this remedy have been somewhat forgotten of late.

Cases of sudden death, with no discoverable lesion; operative procedures for relief of uterine ailments, cleft palate, etc., with drawings of instruments; nitrite of amyl in whooping-cough; the relief of prostatic obstruction by a retained catheter, these and several other subjects are briefly treated in a suggestive manner.

B. L. R.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

Note on a Congenital Band stretching Across the Origin of the Aorta.

Mr. ROBERT SAMUELS ARCHER, Assistant Physician to West Derby Union Hospital, Liverpool, records (*Dublin Journal of Medical Science*, May, 1878) the following note of a specimen which was procured from a case the subject of a coroner's inquiry:—

The aorta and left ventricle having been slit up in the usual manner, a band was found extending right across the aorta. This band was situated just above the line of insertion of the aortic valves, and when the vessel was closed must have flapped up and down in the blood current, as it lay quite loose and slack when the cut surfaces were approximated. Arising by an expansion of about half an inch wide, from that part of the aortic wall which lies just above the junction of the posterior and left lateral semilunar valves (its origin running in a diagonal direction from below, upwards and backwards), it gradually became narrower till it reached its insertion at the junction of the posterior and right lateral cusp of the valve. Its direction thus represented a cord, dividing the circumferential area of the vessel into two unequal arcs, the anterior containing the right and left semilunar valves, and the posterior the posterior valve. It was apparently composed of exactly the same kind of tissue as the valves, which were in every respect normal and competent. The heart and aorta appeared in all other respects to be quite normal during life.

There were no clinical observations made during life of the heart's sounds over the aortic area. Mr. Archer believes the band to have been congenital, and developed together with the semilunar valves, and he regards it as an irregular and supernumerary cusp. An extensive search in anatomical literature leads Mr. Archer to believe this anomaly to be extremely rare, if not quite unique.

Localization of Functions in the Spinal Cord.

LUCHSINGER has recently published three sets of experiments bearing on this subject (*Pflüger's Archiv*, Band xvi, Heft 9 and 10). The first is an application to the spinal cord of the well-known method employed by Kussmaul and Tenner in their researches on the brain. When the posterior half of the cord is suddenly deprived of blood, by simultaneous occlusion of the abdominal aorta and

the subclavian arteries, convulsions take place, strictly limited to the hinder part of the body. The second has to do with the vaso-motor apparatus. The rise of arterial pressure, which is produced by arresting the entrance of air into the lungs, is usually attributed to a stimulant effect of the non-aerated blood upon the general vaso-motor centre in the medulla. Luchsinger shows that spasmodic contraction of the arterioles may be produced by the action of venous blood on the spinal cord after its separation from the medulla, or after the functional vitality of the latter has been abolished, in consequence of ligature of the vessels which supply it with blood. This experiment affords proof of the existence of independent vaso-motor centres in the cord. Lastly, it is usually taught that in picrotoxin, the active principle of the *Cocculus Indicus*, we have a poison which causes tetanic spasms by its selective action on a hypothetical "convulsion-centre" in the medulla oblongata. Luchsinger finds that it may cause convulsions in a part of the body whose innervation is derived from the spinal cord alone, and concludes that its operation is not restricted to any single "convulsion centre," but is coextensive with the motor elements in the gray matter of the anterior horns. The general inference from all the above lines of inquiry is that the proximate centres for all the functions of the trunk are situated in the spinal cord, and not restricted to its upper, highly specialized extremity.—*London Med. Record*, May 15, 1878.

MATERIA MEDICA AND THERAPEUTICS.

Toxic Properties of Carbolic Acid in Surgical Use.

IN the course of four years' experience of the antiseptic treatment, Dr. KÜSTER (Berlin) had met with five cases of poisoning by carbolic acid, four of which were fatal. On examining the literature of the subject, he had found seven mild cases of carbolic acid poisoning with one death, and thirteen severe cases with five deaths. His first case occurred in a woman aged 23, who had a stricture of the rectum, in the treatment of which the parts were repeatedly washed with a 2 per cent. solution of carbolic acid. This was twice followed by collapse, which was so severe the second time that she only recovered after employing artificial respiration for an hour. She died soon afterwards of pyæmia, and at the necropsy a large abscess-cavity was found surrounding the rectum, which might have contributed to the retention and absorption of the injected fluid. In a second case, the washing out of an empyematous cavity in a child with a 2½ per cent. solution of carbolic acid was followed by collapse, and death in three hours. In a third case, a woman, aged 39, had pelvic periostitis and discharge of pus through the bladder. Incision and washing out of the cavity with solution of carbolic acid were followed by collapse and a fall of temperature to 35° Cent. (95° Fahr.), and a second irrigation with a 5 per cent. solution, the next day, was followed by sudden death. The fourth case was one of resection of the hip in a child aged four and a half, who died unexpectedly the next day. The fifth death occurred in a woman aged 33, who, in consequence of erysipelas following an injury of the leg, had a large abscess under the right gluteus muscle, and suppuration of one knee. Death took place four hours after the suppurating cavities had been opened and injected with solution of carbolic acid. Not being able to ascribe these sudden deaths to shock, he made some experiments, to determine the question whether, as was probable, carbolic acid exerted a poisonous action in such cases. It had already been established by the experiments of others that cold-blooded animals were

killed by small doses, while warm-blooded animals required large quantities, ten to twenty grammes (two and a half to five drachms), according to the French, while Husemann had calculated the fatal dose for dogs at 0.5 *per mille* of the weight of the body. Dr. Küster had found that, in relation to the body-weight, the smallest immediately fatal dose was 0.036 per cent., the largest 0.075 per cent. of a five per cent. solution of carbolic acid injected into the blood. The injection of seven and a half grammes was followed by trembling, of ten grammes by convulsive movements, and of fifteen grammes by loss of consciousness; half an hour or an hour later the animal recovered. Larger doses produced also loss of reflex irritability; this agreed with Salkowski's experiments, in which irritation was first produced and then paralysis. In man, as in cold-blooded animals, there was no trembling, but there was the well known dark olive-green colouring of the urine—a hitherto unexplained phenomenon—especially after the external use of carbolic acid; there were also gastric symptoms, headache, vertigo, vomiting, increased secretion of saliva, changes in the pupils (more frequently mydriasis), dysphagia, a rise of temperature with small doses, a fall with larger doses, and a rise after the use of the remedy, or a further fall until death occurred. Dr. Küster was inclined to refer the so-called aseptic fever of Volkmann partly to the action of carbolic acid; and he also suspected the existence of a carbolic marasmus, leading to death. Just as in diseased animals small doses led to fatal poisoning, so in anemic subjects, exhausted by loss of blood, the poison acted more intensely, in consequence of being more readily absorbed. Carbolic acid was especially ill borne in septic fevers, and also in children, who were often in a cachectic state when brought under treatment. There was a local as well as an individual predisposition to easy absorption. Pneumonia and oedema of the lungs were mentioned as sequelæ of carbolism. Glauber's salt had been recommended as an antidote, but, according to Dr. Küster, was useful only in mild cases. He had not been able to avert death by following carbolic acid injection by an injection of the salt, nor by injecting a mixture of the two in solution. He recommended the greatest caution in the use of carbolic acid. In all possible cases he substituted for it chloride of zinc, which, even when used in strong solution (8 per cent.), did not interfere with union by the first intention. He counselled caution in washing the abdominal cavity, and advised that, for children, the strength of the solution of carbolic acid should not exceed $1\frac{1}{2}$ per cent.

Dr. LÜCKE believed that mild forms of carbolism were frequent, but he had never seen a fatal case. The peculiar colour of the urine could not always be taken as a guide, since it often only appeared after several hours' exposure to the air. A more sure test was the use of sulphuric acid and chloride of barium; the absence or deficiency of the white deposits of sulphate of baryta indicated that a certain amount of sulphocarbolic acid had been formed (Sonnenburg). In his experience, the carbolic acid spray produced slight toxic symptoms. He also believed that he had met with a carbolic nephritis, especially in children, and also in an adult.

DRS. BARDELEBEN, KOENIG, and HÜTER had never observed dangerous carbolism. The former recommended mixtures of carbolic acid and sulphate of zinc, and jute impregnated with a 5 per cent. solution of chloride of zinc; the latter recommended the stronger solution of carbolic acid, which more quickly produced coagulation.

Dr. OLSHAUSEN had seen in a parturient woman with rupture of the cervix uteri, carbolism, with loss of consciousness, mydriasis, twitchings of the muscles, but with normal action of the heart and respiratory organs, produced by once washing the uterus with a strong solution of carbolic acid; the symptoms apparently disappeared after three hours. Death, however, soon followed, in conse-

quence, as the necropsy showed, of the passage of carbolic acid into the peritoneal cavity. It was remarkable that an unsparing use of the carbolic acid spray was, as a rule, borne well, while, when he changed his dressings for the first time at the end of five or six days, the result not unfrequently was the appearance of carbolic acid in the urine. He could only explain this by assuming that, under Lister's dressing, the skin was relaxed, and its absorbent power increased. In another lying-in woman, the washing out of a pelvic abscess and the hourly application of pledgets of cotton-wool, soaked in a 2 per cent. solution of carbolic acid, were followed in twelve hours by carboloria and collapse; the use of a 5 per cent. solution on the next day was followed by a return of the symptoms, and by death.

Dr. HAHN had seen the application of carbolized jute in a case of gunshot fracture of the arm, followed by nephritis, which disappeared when the treatment was abandoned.

Dr. VON LANGENBECK recommended great care in the use of carbolic acid. In some persons the existence of idiosyncrasy was beyond doubt. He had met with two fatal cases of carbolic acid poisoning in children in hospital practice.—*London Med. Record*, May 15, 1878.

Therapeutical Properties of Salicylic Acid.

H. KÖHLER gives (*Med. Chir. Rundschau*, Heft 9, Jahrgang 18) as the result of a large number of experiments with salicylic acid and its salts: 1. That in febrile conditions both salicylic acid and sodium salicylate lower the temperature. 2. That in large doses salicylic acid depresses the respiratory activity, and may even cause death by asphyxia. 3. Salicylic acid does not exist in the blood in the uncombined state, but as sodium salicylate, in which state it is eliminated in man at least by the kidneys. 4. Salicylic acid acts as an antiseptic, but sodium salicylate arrests neither fermentation nor putrefaction. In this point of view it is remarkable, so long as we admit the identity of the action of antiseptics and of the antifebrile action of certain drugs, that both salicylic acid and sodium salicylate lower the temperature in typhus, articular rheumatism, and the febrile state of phthisical patients. Köhler set himself the task of determining whether salicylic acid alone or both it and its salts possessed the power of lowering the temperature in healthy dogs, and he was led in the first instance to notice its effects (*a*) upon the respiration, and (*b*) upon the circulation. He found that both in dogs and in rabbits salicylic acid and sodium salicylate, when ingested into the stomach or injected into the blood, rendered the respiration slower, apparently by depressing the excitability of the sensory nerves, *i. e.*, the branches of the vagus in the lung, leading to asphyxia by carbonic acid poisoning. In regard to the circulation he found that when quickly injected and in large quantities the blood pressure rapidly sank almost to zero, followed by convulsions and death, or in some instances by great retardation of the cardiac movements, with sphygmographic curves of immense height, and a more gradually occurring fatal issue. The causes of this depression lay in the heart itself, and appeared to be due to the action of the drug on the ganglionic apparatus or to paralysis of the muscular tissue of the heart. In regard to sodium salicylate, though not acting so rapidly or powerfully as salicylic acid, its effects are essentially the same. The cardiac branches of the pneumogastric have their excitability lowered, and before death are entirely paralyzed, and the same results occur from the ingestion of sodium salicylate into the stomach as from the injection of salicylic acid into the blood. In regard to the distribution of temperature he found that in healthy rabbits, cats, and dogs, the injection of from six to ten cub. cent. of salicylic acid or sodium salicylate into the jugular vein, or the ingestion of from ten to twenty cub. cent. of solution of sodium salicylate into the stomach, caused a depression of

temperature of about three degrees Centigrade (or 5° Fahr.) just as occurs in man during the febrile state. But inasmuch as the sodium salicylate does not possess any antagonistic properties to fermentation and putrefaction, whilst salicylic acid is immediately converted into sodium salicylate after absorption, there is strong reason for not regarding antiseptically acting substances as being also antipyretic. The diminution of temperature observed after their administration can only be partially examined by the above-mentioned modifications of the functions of respiration and circulation, though it undoubtedly goes hand in hand with them; possibly it may be due to some influence on the vaso-motor nerves leading to dilatation of the peripheric vessels, and consequent lowering of the temperature of the blood; this hypothesis affords an explanation of the congestions of the head, singing in the ear, profuse perspirations, and diuresis observed in many animals.

From all this the following conclusions may be drawn: 1. That it is only when externally or topically applied that salicylic acid acts antiseptically. 2. When salicylate acid is ingested by the mouth it loses its antiseptic action because it becomes united with an alkali, and it then only acts on the economy like sodium salicylate when taken internally. 3. Both salicylic acid when taken internally, and salicylate of soda, though destitute of any antiseptic action, are yet capable of depressing the temperature of the body in febrile conditions to an extent unapproached by any other remedy.

As rules for practice Köhler considers that salicylic acid is exclusively to be used as a topical antiseptic, and in this point of view it is extremely valuable in diphtheritis of the tonsils, pharynx, and nose, where it may be applied in the form of solution containing one part in three hundred. Also as a prophylactic remedy in infectious blennorrhœas, in leucorrhœa, and chronic cystitis, and in dysentery and diarrhœa; and it is also useful in dyspepsia and the migraine accompanying it, preventing fermentative processes in the stomach; for this purpose the ferro-salicylate is best adapted. Sodium salicylate can be more readily used on account of its greater solubility. One drachm and a half may be given once or twice in twenty-four hours, which acts more promptly in reducing the temperature in fever than quinine and cold water. Its lowering action on the temperature very rarely fails in acute articular rheumatism, diphtheritis, typhus, or local inflammations. Singing in the ears and deafness are the only inconveniences that occur from the use of sodium salicylate.—*Practitioner*, May, 1875.

Action of Thermal Applications to the Skin upon the Circulation in the Brain and other Organs.

In the *Practitioner*, April, 1878, the views of Dr. WINTERNITZ upon the *rationale* of the action of hot applications to the skin are expounded, and the experiments upon which these views are based are described. It was found by Golz that by repeatedly percussing the abdomen of a healthy frog the heart can be made to pulsate more slowly, and may even be made to stop altogether. When the tapping ceases, the heart generally remains for some little time in a state of stand-still, and when it again begins to pulsate its condition is the same as if the animal had lost an enormous quantity of blood. The venæ cavæ remain almost empty, the circulation in the web ceases, and arteries which are cut through hardly bleed at all. Where, then, is all the blood, since no vessel has been injured, and no blood whatever has been lost? Golz found, on post-mortem examination, that the vessels of the mesentery, and especially the veins, were enormously distended, although none showed a solution of continuity, showing that the vaso-motor nerves were paralyzed, and these vessels consequently dilated.

Tension thus being decreased in the partially emptied vessels, the heart becomes more and more affected.

A similar result follows the division of the splanchnic nerves, as shown by Asp, von Basch, and others, when all other parts of the body are drained excepting the district of dilatation, so that, in the eye, the contraction of the retinal vessels is clearly seen after division of the splanchnics. Thus we see that in the abdominal vessels, controlled and regulated as they are by the splanchnic nerves, we have an apparatus for regulating the blood-pressure in the body generally, and that increased tension, in any vascular district of the body, may be compensated by dilatation of the abdominal vessels. The whole so-called derivative method depends upon the principles just sketched.

The utility of local and general thermal applications to the surface of the body has long been recognized, but the *rationale* of their action has only recently been scientifically established by the experiments of Schüller. He carefully trephined a rabbit on both sides of the sagittal suture, and observed the vessels of the pia mater. Mechanical pressure over the abdomen caused venous congestion of the pia mater. Pieces of ice laid upon the dura mater caused powerful contraction of all the vessels. Where the superior cervical ganglion of the sympathetic had been removed, the application of ice produced no effect on that side. A cold wet compress on the belly or back of the animal produced, almost without exception, immediate and persistent dilatation of the arteries and veins of the pia mater.

A warm wet compress applied to the belly or back had a contrary effect. The vessels contracted less vigorously, the respiration became quicker and shallower. Plunge-baths, hot and cold, have an analogous but more powerful effect than compresses.

A young man lay two hours, naked, on a bed covered with a blanket; then a thermometer was placed in the auditory meatus, another in the axilla, and a third in the rectum. After the thermometer had indicated a constant temperature for some time, compresses were placed on the legs, reaching from the foot to the knee. After fifteen minutes the ear thermometer began gradually to sink, and reached its lowest point after fifty-five minutes, falling as much as 0.4°C . (0.72°Fahr.). In the axilla the minimum loss of heat was only 0.2°C ., while in the rectum the temperature rose 2.0°C .

A further communication is promised upon this interesting subject.—*London Med. Record*, May 15, 1878.

MEDICINE.

Myelogenic Leucocythæmia.

As the result of a long discussion of cases and opinions (*Berliner Klin. Wochenschrift*, Nos. 6, 7, 9, 10, 1878), Professor NEUMANN, of Königsberg, points out that the following conclusions are warranted as to the connection between leukæmia and changes in the marrow of the bones: 1. There are cases of leukæmia, for the development of which no cause can be assigned but disease of the bone-marrow. Hence they may be considered as examples of pure myelogenous leukæmia. 2. No case of leukæmia has as yet been described in which on examination the marrow of the bones has been found normal. Hence there is no objection to the view that leukæmia is *constantly* associated with a pathological alteration of the marrow. 3. The ordinary view that a leukæmia can

originate in disease of the spleen or lymphatic glands requires to be re-examined and tested, since the proofs formerly adduced in favour of it took no account of the marrow of the bones. Of late, not a single case has been observed in which the possibility of disease of the bone-marrow could be excluded, and the leukaemia proved to be of purely splenic or lymphatic origin, with the same certainty as has been done for the bone-marrow in a case of Dr. Litten's, of Berlin, where there was not a trace of disease in the spleen or lymphatic glands. Professor Neumann regards the bone-marrow as "an organ which in every case of anæmia becomes the seat of important alterations which disturb its physiological equilibrium." These alterations, he thinks, consist in a sort of compensatory increase of its physiological hæmatopoietic function, so that the deficiency of red blood-corpuscles in the general circulation is filled up by an excessive development of white cells in the marrow; the final result being, if the anæmia persist, a pathological hyperplasia. "Thus," he says, "it is possible that the transition of a variety of anæmic conditions into leukaemia may be brought about through the medium of the bone-marrow." Of course there is at present but a small basis in fact for this hypothesis, but it may nevertheless direct attention to a new line of investigation which may eventually prove fruitful in results.—*Med. Times and Gaz.*, May 18, 1878.

Contribution to the Pathology of Hæmophilia.

Mr. P. KIDD, in a paper read before the Royal Medical and Chirurgical Society of London (*British Med. Journal*, May 25, 1878), gives a description of a case of hæmophilia in a child six years old, in which fatal hemorrhage occurred from the mucous membrane of the mouth. A short clinical history of the case was given, with an account of the post-mortem examination. The blood was examined, and was found to be very watery, and to contain a large excess of colourless corpuscles. A microscopical examination was made of the aorta and vena cava, and of that part of the mucous membrane of the mouth from which the fatal bleeding took place. This examination revealed an extensive affection of the small vessels, arteries, veins, and capillaries, especially the smallest veins. This affection, which mainly consisted in a great proliferation of the epithelioid cells lining the vessels, was seen in the small vasa vasorum of the aorta and vena cava, as well as in the vessels of the submucous tissue of the mouth. The coats of the aorta and vena cava themselves were healthy. Drawings were given of the affected vessels and also of a portion of the surface-epithelium of the mouth, which had undergone a peculiar change, described in the paper. A certain number of small arteries of the oval mucous membrane had undergone a further change in addition to the epithelioid proliferation. This consisted in a degeneration of their muscular coat, which was seen to contain only a very small proportion of its normal structural elements. The conclusion was drawn that in this case there was a general disease of the small vessels. But, as the blood was also affected, there still remained the question whether this was primarily a disease of the blood or of the bloodvessels.

Spinal Gout.

Dr. OLLIVER communicated (*Gaz. Hebdom.*, May 17) to the Académie de Médecine a case of gout in which he found in the spinal canal appearances due to a uratic infiltration at the external surface of the spinal dura mater—exhibiting, therefore, the characters of true visceral gout. These spinal manifestations have hitherto been rather suspected than described; and in none of the cases related was there furnished any proof of their gouty nature. Until now, in fact, their essential character—the deposition of granules of urate of soda—had never been demonstrated.—*Med. Times and Gaz.*, May 25, 1878.

Writer's Palsy Cured by Strychnia.

At a late meeting of the Medico-Chirurgical Society of Edinburgh (*Edinburgh Med. Journal*, May, 1878), Mr. ANNANDALE showed a patient who a few weeks ago had suffered from writer's palsy. His medical attendant had tried strychnia internally and galvanism without effect. Having studied Bianchi's paper on the subcutaneous injection of strychnia, he resolved to try the method. Before beginning the injections the patient suffered from—1. Want of power in hand; 2. Spasmodic flexion of thumb when writing; and 3. Pain in back of neck. Nine subcutaneous injections had been made into the flexors and extensors of the forearm, with the result of complete restoration of power, removal of pain at back of neck, and partial improvement of flexion of thumb. A splint was now being used to remedy the last. Specimens of the patient's handwriting before and after treatment were shown. Prof. Annandale explained that the hypodermic injection consisted of equal parts of liquor strychniæ (B. P.) and water. Of this 6 mm. were injected every second day, the dose being increased by 1 mm. till it amounted to 12 mm.

Spasmodic Spinal Paralysis in Infants.

Professor ERB, of Heidelberg, remarks (*Betz's Memorabilien*, vol. xxii. pt. 12) that spasmodic spinal paralysis in infants is more frequent than is usually supposed, and is often misunderstood. It is frequently regarded as of cerebral origin, or as connected with the cerebral derangements of childhood; an error to be avoided without difficulty by accurate observation. Symptoms of spasmodic spinal paralysis, complicated with previous paralysis of the arm, and distortion of the face, and coexistent with strabismus, unquestionably point to a cerebral origin. More rarely is it confounded with atrophic spinal paralysis (*tabes dorsalis* proper) which is characterized by its sudden onset, by marked atrophy, by shortcoming and deformity of the limbs, and by the absence of reflex and galvanic irritability. The affection is developed slowly and insidiously, without convulsive or apoplectic symptoms. The legs are moved with difficulty, they are clumsy and stiff, and retained by the tense or contracted muscles in certain fixed positions. Usually the child cannot walk at all, but yet can, when lying down, move the legs though with some difficulty. If the child be supported under the arms, attempts at walking are made, but the thighs are closely pressed together, the knees slightly bent, the feet stretched out, so that only the points of the toes touch the ground, and in progression the feet are continually crossed and stumble one over the other, or in slight cases are dragged along the ground. Standing still is usually possible without difficulty, with some support. The skin is normally sensible, as also the reflex sensibility; the feet are mostly cold. The upper extremities are generally unaffected, likewise the brain and cerebral nerves. The intellect, speech, and movements of the eye are perfectly normal. The general health and nutrition are usually good, and there is an entire absence of atrophy. Dr. Erb describes two typical cases of children under five years of age presenting the above symptoms. In both there was total inability to walk, and the peculiar and characteristic position of the thighs and feet was strongly marked, and there was also some difficulty and indistinctness of speech—while both seemed otherwise in perfect health. Both presented a close resemblance to the locomotor ataxy of adults, and hence the treatment indicated in the first instance was the use of galvanism and cold water applications. But further experience and long-continued observations are needed to clear up the course and nature of these cases.—*London Medical Record*, March 15, 1878.

Treatment of Rheumatic Facial Paralysis by Galvanism.

Dr. J. MASCAREL (*Bordeaux Médical*, September 18, 1877) alleges that he obtains much success from the following method of treating rheumatic paralysis of the facial nerve. On the first day he introduces a platinum needle, a centimetre or a centimetre and a half ($\frac{1}{10}$ ths or $\frac{6}{10}$ ths of an inch) in the direction of the stylo-mastoid foramen, towards the exit of the facial nerve from the cranium. A second platinum needle is placed horizontally in front of the orbit on the paralyzed side, in the superior fibres of the orbicularis palpebrarum; the needles are then connected with the poles of a battery of the desired intensity, and an interrupted current passed during twelve, eighteen, or twenty minutes. Violent contractions are caused by this plan, almost convulsive in the orbicularis palpebrarum, and sometimes the eyelids are closed at the first sitting. The second day, this operation is repeated with the palpebral needle below the eye. On the third, fourth, fifth, and sixth days the facial needle is successively introduced into those muscles of the face which prove most refractory; the other needle is always kept near the stylo-mastoid foramen. After the seventh or eighth day of this treatment the paralysis had disappeared in a dozen successive cases.—*London Med. Record*, May 15, 1878.

Chloral Hydrate in Laryngismus Stridulus.

Mr. WILLIAM STEWART, Hon. Surgeon, Beckett Hospital and Dispensary, Barnsley, states (*Lancet*, May 25, 1878) that in cases of laryngismus stridulus he has found chloral to be the remedy *par excellence*. Soon after commencing its use the laryngeal spasm begins to recur less frequently, and the attacks become slighter and of shorter duration, until at the end of two or three weeks the disease finally disappears altogether.

With regard to the dose. For children six months old, two grains of the drug may be administered three times a day, increased to two grains and a half at twelve months, and to three grains at two years. In these doses he never observed any unpleasant symptom or disagreeable effects from its use.

With regard to its mode of action, it appears to him to be beneficial by blunting the highly nervous excitability which exists in children of this age, and by thus calming for a time the irritability of the nerve involved in producing the spasm a cure is at length effected. To meet the treatment of the constitutional cachexia, he has administered powders of the phosphate of lime night and morning, or a few drops of the syrup of the hypophosphite of lime in order to assist the development of the teeth, and to promote the growth of bone generally, and at the same time he has prescribed dietetic, hygienic, and other remedial agents to remove as far as possible permanently the constitutional causes without which the disease would probably never have had an existence.

Form of Submucous Laryngeal Hemorrhage not hitherto Observed.

In the *Berliner Klinische Wochenschrift* for April 1st, Dr. SOMMERBRODT remarks, that hemorrhage in cases of acute laryngitis is not rare; such cases being described by Dr. Fränkel as laryngitis hemorrhagica. But the following case is unique. A girl, twenty years of age, presented herself in January last, with the statement that, about two hours before, she had, while eating, swallowed something which, she said, had stuck in her throat, causing a pricking pain about the larynx and much discomfort, and that all efforts to remove it, by swallowing bread, etc., had been futile. On examination, there was found projecting into the pharynx from the posterior laryngeal wall a dark, rounded body, of the size of a cherry-stone, while all surrounding parts were perfectly normal. It was soft

and firmly adherent to the inter-arytenoid space, and its manipulation under examination caused no pain. On opening it with a bistoury a quantity of dark blood flowed out, and the swelling disappeared. It was, therefore, a submucous blood tumour of the posterior laryngeal wall, simulating a foreign body. Its origin was due, probably, to bruising of the mucous membrane through swallowing a hard morsel. Similar cases sometimes occur of blood-tumours of the buccal mucous membrane through bruising by the teeth.—*London Med. Record*, May 15, 1878.

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Exophthalmic Goitre Cured by Galvanization of the Sympathetic.

Dr. ANCONA (*Giornale Veneto delle Scienze Mediche*) relates the case of a young girl, aged 19, of habitually bad health, who suffered from exophthalmos and goitre. She was emaciated, weak, suffered from diarrhoea and frequent flushings of the face; was irritable and capricious, and unceasingly dyspeptic. Dr. Ancona proposed galvanization of the first cervical ganglia of the sympathetic. The poles of a Stöhrer's battery were applied on each side of the neck, behind the angle of the jaw, pressing backwards the sterno-mastoid muscles. A current of ten elements was passed for a time varying from three to five minutes. After a few days, the circuit was frequently interrupted. The physiological effects observed were the following: dilatation of the pupil each time the current was closed, more marked on the side of the negative pole; slight contractions of the sterno-mastoid; scalorrhœa, with a taste of copper in the month; sometimes giddiness. At the end of five months, a hundred electrizations had been applied and very well borne. Arsenical treatment was added. From the beginning of the application of electricity, there was notable amelioration, and at the end of five months the state of the patient was very satisfactory. Her weight had increased by 30 lbs. Her face and mucous membrane resumed their normal colour; her eyelids regained their mobility; the thyroid gland diminished in volume; the arterial pulsation ceased to be visible; the pulse of the heart became regular; the pulse fell; menstruation became regular; digestion was restored; and strength returned.—*British Med. Journal*, June 1, 1878.

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Treatment of Asthma by Subcutaneous Injection of Arsenic.

Dr. MARTELLI reports, in the *Gazzetta Medica Italiana (Allgemeine Med. Central. Zeitung*, No. 2, 1878), the case of a man aged 30, who had suffered from repeated attacks of asthma, which were not relieved by various methods of treatment, including subcutaneous injection of strong solutions of morphia. Dr. Martelli used subcutaneous injections of Fowler's solution of arsenic (one part to two of water). Two or three syringefuls were injected through the same puncture. The effect was remarkable; the paroxysms at once ceased. After two drachms of the arsenical solution had been used, the disorder quite disappeared, and the patient's health improved greatly. Later, there was a return of the asthma, which was subdued by two injections of the solution. The injections were not attended by any troublesome results, local or general, beyond pain in the arm of very short duration.—*London Med. Record*, May 15, 1878.

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Morbid Local Temperature in Pleurisy.

Prof. PETER, in a communication to the Académie de Médecine (*Bulletin*, April 30), states that he is desirous of recording the results of a long series of investigations on morbid local temperatures in which he has been engaged. His first communication relates to the *temperature of the thorax in acute pleurisy*, and the variations which this undergoes, according to certain determinate condi-

tions, in relation to the normal mean temperature and the parietal temperature of the healthy side. This is not, he says, a piece of mere scientific curiosity, but has immediate useful clinical applications, enabling us, among other things, to establish a diagnosis in doubtful cases of commencing pulmonary tuberculation.

The results of his investigations show: 1. On the side of the pleurisy the parietal temperature is always greater than the mean temperature (35.8°C.); this morbid excess, or *local hyperthermy*, amounting to from 0.5° to 2° and more, since the local temperature may reach 38° , 39° , or even 40° . 2. The elevation of temperature increases with the effusion, *i. e.*, this increase corresponds to the period of secretory activity of the inflamed pleura, and may amount to 2.5° or 3° . 3. This temperature decreases as soon as the level of the effusion remains stationary, that is, when it ceases to be produced. But, generally, the parietal temperature still exceeds that of the unaffected side by from 0.5° to 1.5° . 4. Not only does the pleurisy raise the temperature on the affected side, but also that on the opposite side; but the temperature is always higher (from some tenths of a degree to one degree or more) at the former than the latter. 5. The parietal temperature becomes gradually lower as the effusion is spontaneously absorbed, always, however, remaining higher (generally by some tenths of a degree) than on the sound side, such increase persisting for a considerable time. Such persistence is not to be neglected, as it indicates the continuance of the anatomical conditions which give rise to the effusion, and the possibility of a relapse. 6. In cases of pleurisy without effusion (as diaphragmatic pleurisy, for example) the local hyperthermy is less high, and the normal temperature returns more rapidly. 7. Perhaps one of the most interesting facts is that the *absolute elevation* of the local temperature of the bad side is more considerable than the absolute elevation of the axillary temperature, although the axillary thermic figure may be higher than the parietal thermic figure. This local hyperthermy precedes the axillary hyperthermy—two circumstances which demonstrate the predominant influence of the pleuritic morbid process over the general condition, or at all events over the general temperature. 8. When the effused fluid is evacuated—that is, the cavity of the pleura emptied—an unexpected phenomenon is immediately produced; the elevation of the parietal temperature on the punctured side; and one of two circumstances may take place. (a) If the effusion is not reproduced, the temperature (which before the puncture was higher than normal and higher than on the sound side) may rise some tenths of a degree still higher. But this is the case only for from twenty-four to forty-eight hours, after which the parietal temperature sinks first to the figure it stood at before the operation, and then continues to decrease till it reaches the normal figure, 35.8° . (b) If the secretion is reproduced and then absorbed again, during the period of renewed secretion, the local temperature rises very notably, as much as 1° some hours after the puncture. It hovers about this hyperthermy for some days, then decreases under the influence of medicinal agents, returns to the figure it stood at prior to the puncture, and finally returns to the normal state. It is remarkable that, both as regards the elevation and depression of the temperature, the parietal temperature always precedes the axillary temperature, the local malady seeming still to govern the general temperature. When for the reproduced effusion, puncture requires to be again resorted to, we have local preceding general hyperthermy, and then a stationary condition of the local temperature during the effusion. After a new puncture the same thermic and secretory phenomena are reproduced.—*Med. Times and Gaz.*, June 1, 1878.

Franck and Bellouard on the Diagnostic Value of the Radial Pulse in Innominate Aneurism.

The radial pulse below an aneurismal tumour generally presents two peculiarities of great diagnostic value: firstly, diminished fulness; secondly, a delay in point of time as compared with the pulse of the opposite wrist. By reason of its greater constancy, the second of these, the delay, is by far the more important of the two. A case of innominate aneurism examined by Dr. Panas shows of how little value is diminished fulness regarded as a symptom, for the radial pulse below the aneurism showed considerable fulness, whereas the left pulse was so small as hardly to be appreciable by the sphygmograph. M. Buequoy mentions a similar case. A careful examination of the circulatory disturbances of the arm, face, and fundus of the right eye led these two observers to attribute the increase of fulness, in the instances just alluded to, to vaso-motor paralysis consequent upon functional derangement of the first thoracic ganglion of the sympathetic, due to compression by the largely developed aneurismal tumour. In a patient with innominate aneurism mentioned by M. Bellouard, a slight sinking in of the globe of the right eye, a decided diminution in the palpebral orifice, and a well-marked excavation of the optic disk were observable, and were known to have been present for a long time. The field of vision of the affected eye was reduced to nearly zero on the nasal side, which confirmed the ophthalmoscopic appearances of the disk. There was also present a marked diminution in the acuteness of vision of the right eye as compared with the left.

This case offers an excellent opportunity for studying the relations existing between paralysis of the sympathetic, nutritive disturbances of the fundus of the eye, and partial atrophy of the papilla entailing diminution in the field and in the acuteness of vision; for there can be no doubt that in this case the ascending sympathetic filaments from the first thoracic and inferior cervical ganglia were paralyzed. Those from the first thoracic ganglion supplying the vessels of the upper extremity being similarly affected, the fulness of the radial pulse is accounted for.

The sphygmographic tracings of the right pulse shown by M. Franck display a suddenness of impulse altogether absent in those of the left side. In consequence of this energetic circulation in the right upper extremity, and contrary to what one generally observes in aneurism, there was an elevation of 1° F. on the affected side, of which the patient was herself perfectly conscious.

It may therefore be concluded that the smallness of pulse and fall of temperature below an aneurism may be replaced by inverse symptoms, provided the aneurismal tumour compresses and paralyzes the sympathetic ganglia or filaments concerned in that region. Again, symptoms of either kind may be altogether absent; at any rate their uncertainty and their dependence on adventitious conditions should render them of second-rate importance. Of first-rate importance is the delay of pulse which no nervous influence can suppress, though the peripheral vascular dilatation and consequent easy flow of blood in the extremity tend to render it less distinct. By means of an apparatus devised by M. Franck, he shows that during the expansion of the tumour the pulse of the right hand is delayed a third after that of the left, in the case above alluded to.

Though the absolute amount of delay varies with circumstances, and is necessarily influenced by all kinds of conditions, yet its constancy, the fact that there always is delay, however slight, renders this symptom of the very highest diagnostic value in cases of suspected innominate aneurism.—*London Med. Record*, March 15, 1878.

Case of Hepatic Abscess Opening into the Lung: Successful Treatment by Carbolic Acid.

Dr. P. CARRESCIA relates, in *Il Morgagni* for December, 1877, the case of a man who, having suffered for a long time from a malarial affection, was suddenly attacked with vomiting of pus, due, without doubt, to the bursting into the bronchi of an abscess of the liver. In these circumstances, Dr. Carrescia, remembering the remarkably beneficial effects of carbolic acid in suppurative pneumonia, was led to employ it as a disinfectant and modifying agent on the abscess. After sixteen days of treatment by the daily administration of from 15 to 40 drops of a solution of carbolic acid [of what strength?], the patient gradually completely recovered. The author does not overlook the fact that abscess of the liver may heal spontaneously; but, in the present case, the rapid diminution of the pus, the absence of pain, and the improvement of nutrition, appear to him to render the effect of the treatment undeniable. He concludes, therefore, that the internal use of carbolic acid in abscess of the liver may exercise some special action such as has already been described in suppurative pneumonia, and expresses the desire that the value of the treatment may be tested by clinical observation.—*London Med. Record*, May 15, 1878.

Diabetes Insipidus rapidly Cured by Ergot.

A recent number of the *France Médicale* contains an account of a very severe case of polyuria which rapidly yielded to the internal administration of ergot of rye. The patient was a man, æt. 46, and the symptoms followed a prolonged immersion in the sea. They were ushered in by giddiness, pain in the head, and nausea; to these were soon added profuse perspiration, frequent desire to pass urine, thirst, and increased appetite. The daily quantity of urine rose to 350 ounces, of a sp. gr. of 1017. Neither albumen nor sugar was present. The quantity was reduced by atropine, but the other effects of this remedy were very disagreeable to the patient. Ergot of rye was then given, in doses of seventy-five grains daily, and in nine days the quantity of urine was reduced from 240 to 70 ounces. The other symptoms also disappeared, and the patient soon regained his normal condition.—*Med. Examiner*, June 6, 1878.

Treatment of Obstinate Sciatica by Subcutaneous Injections of Nitrate of Silver.

Dr. AUGUSTE DUREAU has had the opportunity of observing, in MM. Damaschino and Gerin-Roze's wards, the generally favourable results obtained in the treatment of obstinate sciatica by the method of Dr. Luton, of Rheims. M. Dureau (*Thèse de Paris*, Feb. 27, 1877) recommends that the end of the canula of the subcutaneous injection-syringe should be inserted deep enough to go through the dermis. The injection has always been made in the nates at the point where the sciatic nerve emerges. M. Dureau furnishes the following indications as to the preparation and quantity of nitrate of silver employed. Dr. Damaschino always employs a twenty-five per cent. solution in doses of five drops, and it has always yielded good results. Dr. Luton varies the strength and the quantity of his solution, sometimes using from twenty to twenty-four drops of a ten per cent. solution, sometimes the same quantity of a five per cent. solution. The solution employed by Dr. Bertin, of Gray, is a five per cent. one, and the number of drops injected varies from 15 to 20 or 25 drops. Dr. Gerin-Roze uses the fifteen per cent. solution in doses of 15 drops. Out of twelve cases, this physician has had some cures, some cases of improvement, and some which remain *in statu quo*; he has never, however, seen any unpleasant results. M. Dureau comes to the follow-

ing conclusions: 1. The injections of nitrate of silver are recommended for old and obstinate neuralgia. 2. Irritation from injections into the depth of the tissues is not to be feared, as is generally supposed. 3. The mode of applying the drug allows the affected point to be reached, and gives so much the more certainty to its action. 4. Cure or improvement is very rapid. 5. Finally, this method is less alarming and much more efficacious than the hot iron.—*Lond. Med. Record*, March 15, 1878.

Coloured Exudation in Eczema.

Dr. LINDSAY gives, in the *Medical Times and Gazette*, March 9, 1878, pp. 247, 273, details of a case where the dressings from an eczematous leg were stained blue, and occasionally green. The patient, aged 35, a tall, handsome, athletic man, had been subject to periodic attacks of eczema; and during one of his usual attacks, wherein the legs were affected, and which attack extended over several weeks, the various dressings applied to the leg, as well as the drawers, stockings, or other articles of clothing that became fouled, all assumed various shades of blue, sometimes of green, just as though they had been purposely stained with a solution of sulphate of copper or of indigo. That no deceit was practised was certain. No medicines were being administered internally at the time, and no local applications but simple water-dressings were used. The urine was normal and free from colour. He was the subject of a certain degree of mental imbecility, the result of "cram" at sixteen years of age. Dr. Lindsay brought the case before the notice of Drs. McCall Anderson and Peel Ritchie. To the former it was new: the latter gentleman had seen similar cases, and believed it might be due to renal inadequacy. In the concluding part of his interesting paper, Dr. Lindsay gives a good deal of useful information upon the literature of the pigmentary exudations in the different secretions of the body, viz., pus, urine, sweat, serous effusions, etc.—*London Med. Record*, May 15, 1878.

Urticaria following the Administration of Salicylate of Soda.

In the *Aerztliches Intelligenz-Blatt* for April 9, Dr. HEINLEIN, of Erlangen, communicates the following case which occurred during the last winter.

C. K., a house-painter, aged 45, had a severe attack of articular rheumatism in 1853, from which he recovered slowly. Since then he had several further attacks, and while suffering from the last was admitted to the polyclinic, at Erlangen, on November 17, 1877. He presented the usual symptoms of rheumatic inflammation in the elbow and knee-joints. The pulse was intermittent throughout the course of the case, raising the suspicion of a fatty heart, which was further indicated by the pasty appearance of the patient, and by his acknowledged addiction to alcoholic liquors.

During the first ten days, salicylate of soda was given in hourly doses of 7.7 grains (0.5 grammes) without any effect. Thereupon the dose was increased to 60 grains (4.0 grammes) with the following result. Soon after this first dose was given, there came on intense tingling and itching of the skin. The left side of the face, the lower extremities, and the right side of the chest were diffusely reddened, while both eyelids, the upper lip, and a great part of the legs were slightly œdematous. The pulse stood at 90°, temperature at 101.8° F., and the urine was slightly albuminous. At the same time all pain in the affected joints had vanished, and they could be freely moved about. By the next morning the redness had disappeared, and the pulse and temperature had fallen respectively to 80° and 100° F. In order to ascertain how far these symptoms were the result of the treatment, it was determined to repeat the dose at the next opportunity.

The patient continued free from pain for the next three days, but on the fourth day the articular pains returned with such severity, that the patient himself begged for "the large powder." Sixty grains (4.0 grammes) of salicylate of soda were given; after fifteen minutes, severe burning pain in the frontal integument supervened, and five minutes later strong itching on the back of the right hand. In half an hour a marked eruption of urticaria was established over the greater part of the body, especially the legs and abdomen, with some œdematous swelling of the arms, eyelids, etc. This disturbance moderated in the course of two or three hours, and had completely subsided the next day. Subsequently, several smaller doses were administered without producing any of the above effects, and the patient recovered. After his recovery the patient consented once more to take the larger dose, and the result was precisely the same as before. Hence it is evident that salicylate of soda must be classed with those drugs—cubeb, copaiba, santalin, turpentine, valerian—the administration of which is sometimes attended by urticaria.—*London Med. Record*, May 15, 1878.

SURGERY.

Morbid Anatomy of Tetanus.

Dr. E. AUFRECHT, of Magdeburg (*Deutsche Medicin. Wochenschrift*, April 8), gives an excellent account of the morbid appearances found in the spinal cord of a case of tetanus. The patient, a labourer, aged 41, got a compound dislocation of the thumb, which was treated by Lister's method. Eight days afterwards, spasm of the muscles of the jaw and neck set in, for which Dr. Hagedorn stretched the median nerve, but with no good result, as the patient died two days after the first appearance of the tetanic symptoms. At the post-mortem examination, the sac of the spinal dura mater contained a considerable quantity of serum, and the cord, both gray and white matter, was obviously hyperæmic. After hardening for three months in a solution of bichromate of potash, which was changed every day or every second day, sections were made and carefully examined with the microscope. Throughout the cord, the vessels were found distended with red blood-corpuscles; this hyperæmia involved arteries, veins, and capillaries, as was proved by careful isolation. Around the larger vessels, especially in the lumbar region, there were found masses of a hyaline-looking substance, which appeared either dull or with short bright transverse striation. This material adhered to the adventitia, even when the vessels were isolated. He is inclined to regard this material as fibrin, but is bound to point out that it was present also in the cavity of the central canal. More frequently, dark granules of pigment and fatty-looking molecules were present in the adventitia. In the white substance, he found many granules of pigment, etc., and many of the nerve-fibres had fine granules in their medullary sheaths, which gave these latter a dusty appearance. The most marked changes were found in the cells, those of the cervical region having the lesion most pronounced, while, on passing down the cord to the lumbar region, the departure from the normal became less and less, although even in the latter region the morbid appearances were still manifest. These alterations were diminution in the size of the cells, increase of pigment, loss of their processes, disappearance of nuclei and nucleoli, the cells becoming of a diffuse yellow colour and containing refractile drops, or looking like structureless yellow lumps. The cells of the anterior horns of the lumbar region were quite normal, except perhaps a slight excess of pigmentation; those

of the posterior horns were in various stages of degeneration. In the cervical region, not one single normal cell could be seen; they were represented by rust-coloured lumps without nuclei, nucleoli, or processes. In addition to the changes in the cells themselves, the gray matter contained many fine granules and coarser angular coloured grains, which quite resembled the pigment-grains of the cells. These were grouped especially round the central canal, which seemed wider in the cervical region. The epithelium of the central canal was normal, but the lumen was in many places narrowed; an appearance, he believes, not due to his mode of preparation. There were also around the central canal many globular bodies without any contour, which resembled oil-globules. Dr. Aufrecht compares these appearances with those described by Lockhart Clarke, W. H. Dickinson, and Tyson. He agrees with Lockhart Clarke in describing the change in the cells as granular degeneration; but differs from him in so far as he is rather inclined to regard their cell-changes as primary; in fact, as a parenchymatous inflammation analogous to what takes place in the cells of the liver and of the sympathetic ganglion, and not as secondary to the vascular disturbance. He is by no means sure that the masses around the vessels were really fibrin, but is disposed to consider them colloid. This part of the paper seems rather weak, and we are by no means convinced by his arguments; for instance, he contends that, as the hyperæmia extended for the whole length of the cord, while the changes in the parenchyma diminished in their intensity in passing downwards, therefore there was no relation between the two; that the granules were not numerous around the vessels; and that some of the fibrin-looking material lay in the central canal. He contends that there is nothing characteristic of tetanus in this material, as Hayem found it in two cases of acute diffuse central myelitis. This we should not dispute, as we rarely expect to find anything characteristic in the nature of an exudation. Dr. Aufrecht's observations are an important addition to our knowledge of the morbid changes in tetanus, and go to support the view that the lesion consists in an acute diffuse central myelitis.—*British Med. Journal*, May 18, 1878.

The Union of Divided Bloodvessels.

The union of divided bloodvessels has been carefully studied by PFITZER in the Institute for Pathological Anatomy at Königsberg. The process was investigated in the rabbit. The wound was found to be first closed by a thrombus containing abundant cells—the “white thrombus” of Zahn. In about twenty-four hours, however, hardly any cells were to be seen, the material closing the wound consisting then only of a homogeneous structureless mass of fibrin. Two days later, the endothelium in the entire circumference of the vessel was swollen, and on the third day connected with the endothelium, and apparently arising from it, a single layer of spindle-cells lay in the fibrinous mass. Beneath the swollen endothelium, close to the wound, were several layers of irregular cells, very different from pus-corpuscles. After this date, the wound adjacent to the lumen of the vessel was closed by this layer of spindle-cells, continuous with the endothelium of the vessel. Next, cells arise in connection with the adventitia of the vessel, at first round, then becoming spindle-shaped, and ultimately passing into cicatricial tissue. Whether these are developed from pre-existing cells or from cells which have wandered out of the vessel is left uncertain. They become connected with the spindle-cells which have proceeded from the endothelium and subendothelial cell-layer. Gradually the cells are transformed into tracts of tissue of cicatricial aspect, and in eleven days only such tissue is to be seen closing the wound. Thus it would appear that a double process takes part in the union. On the one hand there is a proliferation of the endothelium of the vessel, and on the

other an inflammatory growth of tissue proceeding from the divided adventitia of the vessel. The participation of the white blood-corpuscles in the process apparently ceases with the formation of the provisional plug.—*Lancet*, May 18, 1878.

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The Application of the Antiseptic Method in Cases where Sepsis is already present.

Dr. KÖNIG (Göttingen) read a paper on this subject at the late congress of the Society of German Surgeons. If Lister's antiseptic method, intended at first only for the treatment of clean wounds, obtain a lasting value in surgery, it must soon be extended to cases in which inflammation and sepsis are already present; and in this respect it has already been strikingly proved to be useful. In many cases of suppurative inflammation of tendons, the necrosis of the tendons has been prevented by making, as early as possible, numerous incisions along the whole track of the inflammation, and thoroughly washing and rubbing the sheaths of the tendons with a 5 per cent. solution of carbolic acid; after which drainage-tubes were applied, and the limb, being suspended, was irrigated by the constant dropping on it of a weak solution of salicylic acid. In recent cases of empyema it was sufficient, according to Dr. König, to make an incision at the most dependent part, and resect a portion of rib, and then to wash out the pleura with a 5 per cent. solution of carbolic acid. To remove the secretion which re-accumulated, a drainage-tube was applied, the body being placed in a proper position, and the part was dressed antiseptically. The treatment of septic wounds, especially those complicating fractures, by means of powerful disinfection, with division and removal of the destroyed and dead parts, was illustrated by the account of a case of compound fracture of the thigh and leg, with gangrenous emphysema, in which life was preserved by amputation and the observance of the plan above mentioned. Such good results, however, could be obtained only by the abundant use of carbolic acid, as a result of which he had now and then met with toxic symptoms, never, however, ending in death. He discarded the silk protective, and laid gauze direct on the wound or ulcer, in order to better obtain absorption and consequent disinfection of the secretions.

Dr. BARDELEBEN (Berlin) said that since 1872 he had used carbolic acid irrigation with the best results, in cases of the kind described by Dr. König. He had never seen special toxic symptoms, even after prolonged irrigation with carbolic acid, although most of his patients passed dark-coloured urine. A solution of thymol (1 part in 1000, with the addition of some alcohol) had already been used in his wards in 1875, but had been given up, partly on account of the sweetish smell of the agent, and partly because it attracted swarms of flies. A renewed experience of thymol during the past year had taught him that the results obtained by it did not surpass those of a $1\frac{1}{2}$ or 2 per cent. solution of carbolic acid. If thymol had not the unpleasant paralyzing action on granulations, it yet did not possess the higher antiseptic properties of unconcentrated (*e. g.*, 5 per cent.) carbolic acid solutions. To these, as well as to solutions of chloride of zinc (both advocated by Lister), surgeons had limited themselves in the disinfection of already putrid parts; and, if he had the choice, he would prefer chloride of zinc, as its action was more readily limited than that of carbolic acid.

Dr. HÜTER (Greifswald) had, since 1869, used antiseptic irrigation with good results in the treatment of septic wounds. With regard to carbolic acid poisoning, he considered that strong solutions were more harmless than more diluted ones. Irrigation with carbolic acid was of special benefit in intermuscular phlegmon of the forearm, especially when combined with numerous buttonhole incisions. The success obtained by the use of carbolic acid irrigation in the case of a boy whose

abdominal wall was injured by a threshing-machine, had led him to use it in herniotomy; the result being that he no longer met with peritonitis after the operation, and that the wound healed by the first intention, so far as the part where the drainage-tube lay.

Dr. KÜSTER (Berlin) had used thymol very extensively since the beginning of the present year, but had already abandoned it as an aseptic, on account of its failure. He especially ascribed two deaths after laparotomy to the use of thymol. Whether it would be found applicable in minor operations was very questionable, as it was quite as expensive for dressings as chloride of zinc, if not more so.

Dr. OLSHAUSEN (Halle) agreed with the observations of Dr. Küster respecting the use of thymol in cases in which the abdomen was opened.

Dr. SCHEDE agreed with the previous speakers as to the good results of carbolic acid irrigation and the uncertainty of thymol. Whatever good results had followed the use of the latter were perhaps in part to be explained by the fact that, in a hospital in which antiseptic treatment was rigidly carried out, all recent wounds showed no tendency to septicity. He had lately used hyposulphite of soda for antiseptic irrigation; it could be employed in a 5 per cent. solution, or even stronger, in any quantity, without fear of toxic action.

Dr. KÖNIG said that there was a misunderstanding with respect to the use of solution of carbolic acid. He used it for washing, not for continued irrigation; for the latter he used salicylic acid.

Dr. THIERSCH (Leipsic) regretted that none of those who had lately praised thymol were present to speak in its defence. He had made no special experiments with it, but he believed that the difference in its effects depended on the time during which and the manner in which it had been kept.

Dr. BIDDER declared against the general use of thymol, which he recommended only for washing out the cavities in empyema and abscess.

Dr. WAGNER had seen three cases of empyema in which complete recovery took place in eight weeks, after treatment by double incision, the use of a drainage-tube, repeated washing out of the cavity, and gradual removal of the drainage-tube after eight days, until only a small piece was left in the opening.

Dr. SCHEDE advocated resection of one or more ribs, both in children and in adults. In this way the diminution of the cavity in empyema was more rapid. He would use salicylic acid or thymol for washing out, only when symptoms of poisoning followed the use of carbolic acid.

Dr. VON LANGENBECK recommended thymol in the case of children, although wounds did not always run an aseptic course under its use.—*London Med. Record*, May 15, 1878.

Lymphadenoma with Retinal Hemorrhages.

M. CHAUVEL (*Gazette Hebdomadaire*) reports a characteristic case of lymphadenoma. A custom-house officer, aged 41, entered hospital on account of a tumour on the left side of the face. He had always been healthy; there was no history of inherited or acquired syphilis or other disease. Four months previously, a small painless tumour had appeared spontaneously on the left upper eyelid. It grew very rapidly, and began to be painful. On entering the hospital, the patient had infiltration of the lymphatic glands of both sides of the neck, particularly the glands along the sterno-mastoid. On the apex of the tumour, somewhat above the left eyebrow, was a reddish sensitive spot. The mucous membrane of the left cheek presented some grayish ulcers. A few days later, diffuse swelling of the face, particularly in the left supra-orbital region, was observed, extending somewhat over the median line towards the right. The cheek was double its normal thickness; the swelling faded insensibly into the surrounding tissues. There were

severe neuralgic pains in the left side of the head, earthy coloration of the skin, and great weakness. Under the mucous membrane of the cheek, hard nodules could be observed, with greenish gray patches about the upper molar teeth; some days later the right cheek became swollen, but its mucous membrane remained unchanged. The mouth gave a fetid odour. The patient was sleepless, but showed no disturbance of circulation, respiration, or digestion. Some days later the patient complained of a black spot before the right eye (the left eye was closed by the tumour), and on ophthalmoscopic examination several hemorrhagic spots could be observed on the retina. The diagnosis of leukemic retinitis was made. Excepting the glands of the neck, no other lymphatic glands were observed to be enlarged. The spleen was only slightly enlarged. The blood was not examined. The patient died at the end of four weeks. The post-mortem examination showed no emaciation. The tumour was situated chiefly in the skin and subcutaneous cellular tissue. Section showed all the soft tissues, down to the healthy periosteum, changed to a mottled structure. The lymphatic glands presented the same appearance, which was shown by the microscope to be that of a characteristic lymphatic tumour. The spleen was somewhat enlarged; the liver was very large and pale, its intralobular capillaries showing a large proportion of white corpuscles; there was much albumen, with fibrinous casts, in the urine.—*Lond. Med. Record*, May 15, 1878.

Removal of an Enormous Lipoma.

Dr. WOLFLER, one of Prof. Billroth's assistants, narrates (*Wiener Med. Woch.*, March 16) an interesting case of operation for a large lipoma which was performed in that surgeon's Klinik. A man aged seventy-one having entered the Klinik, August, 1877, with the desire that a large tumour should be removed, the question was raised whether, in a person of his age, it would be prudent to undertake such an operation. The great substance and breadth of the pedicle of the tumour in this case added to the usually unfavourable view taken of removing very large tumours. On the other hand (1) the patient ardently desired to be rid of his malady; (2) he suffered much from the weight of the tumour, and from the excoriation, eczema, and ulcerations which its friction against the skin of the back induced; (3) the appearance and bodily condition of the patient were very favourable, in spite of his thirty years' endurance of his calamity; (4) the employment of antiseptic treatment held out the hope that the danger of exposing so large a surface would be reduced to a minimum. The tumour hung down from the shoulders to the upper part of the sacrum, covering the nates to a breadth of sixty-nine centimetres. In length it measured one metre fifteen centimetres, and its greatest breadth reached one metre thirty centimetres. Its pedicle, which for the most part sprang from the skin of the left shoulder and nape, measured fifty-eight centimetres in breadth, and at its left edge a pulsating artery could be felt, the calibre of which corresponded to that of the brachial artery. Near this a vein was seen of the thickness of the vena cava, which towards the neck separated into two branches, one seeming to join the external jugular, and the other pursuing its course towards the subclavian vein. The tumour itself consisted of two parts—a middle portion which felt soft and lobulated like a lipoma, and was covered by movable skin; and of a much more dense peripheric portion, which was intimately united with a thick, tumefied skin, and conveyed the impression of a fibroma molluscum. The pedicle of the tumour, although so very thick, scarcely seemed able to sustain the great weight of the tumour, so that its left edge was ruptured to the extent of three centimetres.

The operation was performed under carbolic acid spray on the day after admission. The large quantity of blood which the tumour contained was forced back

into the body by four elastic bandages, and an elastic tubing was then applied around the pedicle, and prevented slipping away by means of long pins, which were inserted into the pedicle in front of the tube. The operation was then executed with ease, an anterior flap being first formed from the skin of the pedicle, and afterwards, on the tumour being raised by two strong assistants, a posterior flap. The large vessels which coursed through the œdematous and hypertrophied subcutaneous tissue were secured by double ligatures, and divided between these. The fasciæ of the tumour were next divided, and the tumour removed. On the removal of the tubing, which had done such good service, there was only a little bleeding from the periphery; thirty-five catgut ligatures were applied. The retraction of the skin of the neck, which had been anticipated, did not take place; and the flaps which had been made, being too large, had to be much diminished. The wound was united by thirty-five sutures, drainage-tubes were inserted, and an antiseptic bandage applied. The operation occupied two hours.

The tumour weighed twenty-five kilogrammes (between fifty and sixty pounds avoirdupois), and about a third part of it consisted of a lipoma, which was easily separable from surrounding parts. The remainder of the tumour was composed of an extraordinary hypertrophy of the connective tissue, very œdematous, and containing a gelatinous infiltration, covered by a cutis, which was thickened as in elephantiasis. The wound healed so promptly that the man was dismissed on the eighteenth day after the operation; and when he was last heard of, in November, the cure continued complete.—*Med. Times and Gaz.*, May 18, 1878.

Narrowing of the Larynx by Membranous Cicatrices following Syphilis.

In a paper in the *Berliner Klinische Wochenschrift* for April 1st, Dr. SOMMERBRODT, of Breslau, strongly opposes the statements of Kaposi regarding the extreme painfulness of syphilitic ulceration of the larynx. He rather regards the almost entire absence of pain in laryngeal ulcers as diagnostic of syphilis, seeing that cases have often occurred where the entire epiglottis was destroyed by ulceration, while the patients complained of little more than discomfort in the throat; or that, in cases of cough and supposed lung-disease, the only discoverable disease consisted of a deep ulcer and defect of the epiglottis; or lastly, that, with extensive ulcerations of the vocal cords, the only symptom was a certain rough hoarseness of the voice. On the other hand, he regards exquisitely painful ulceration of the larynx and epiglottis as pointing rather to phthisical affections. The absence of pain in syphilitic ulcerations of the larynx may indeed lead to the danger of their being overlooked or neglected, though this risk is somewhat compensated by the tendency of these ulcers to heal spontaneously, without any permanent bad results, excepting a certain functional derangement of the voice. The number of cases is, nevertheless, considerable, in which serious injury to the larynx remained even after a radical cure of the original disease. Of these, the most interesting and important are those instances of membranous cicatrices stretched across the laryngeal tube; since, on the one hand, they involve the gravest disturbance of the laryngeal function, and also, on the other hand, admit of operative interference. The entire number of cases of this kind on record amount to 22—of these, 6 are described by Elsberg of New York, while 11 are reported from the southeast of Europe, and the remainder by various writers. It is somewhat remarkable that three-fourths of the European cases occurred in the extreme east, showing the natural indolence and apathy of the inhabitants of those regions, who only seek aid when affected with grave disorder, especially if the attendant pain be inconsiderable. Thus, the first case observed by Türk (*Krankheiten des Kehlkopfes*, 1866, pp. 408, 409) was that of a man who, for

three years previously, had been the subject of syphilis, and in whom the nasal bones had fallen in, and the uvula and a large portion of the soft palate had been destroyed, while the vocal cords had become connected by a membranous cicatrix to such an extent that there remained in the posterior portion of the rima glottidis only a small round opening, not much more than one-tenth of an inch in diameter, for the admission of air.

In the case described by Dr. Sommerbrodt himself, the patient, a woman, aged 36 years, came under treatment on January 16, 1877. She began to suffer eighteen months before this from a painful affection of the throat, with great dysphagia; then hoarseness supervened, and latterly, increasing dyspnoea, which interfered with her occupations. The cervical glands on the left side were indurated, the pharynx was normal, and her general health fair. The epiglottis was strongly reddened, the false cords were injected and ulcerated near the anterior commissure, while their jagged edges, to the extent of about one-eighth of an inch, were in close contact; from below, the oedematous mucous membrane projected over the remaining portion of their free border. The voice was very husky, and there was considerable dyspnoea on walking, etc., while the arytenoid cartilages on both sides were movable. The case was evidently syphilitic in its nature; a view confirmed by the results of treatment. The patient was put upon potassium iodide, and after eight days the mucous oedema and injection had greatly diminished. In fourteen days the commencing union of the true cords at their anterior third became perceptible. After six weeks it was seen that the true vocal cords were united by means of a uniform white and tense membranous cicatrix, with a free and very thin posterior margin, and on its upper surface two minute bloodvessels ramified, emerging from the commissure. When phonation was attempted, this membrane was folded downwards, so that the arytenoid cartilages became closely approximated. The dyspnoea now became much less, though the free space between the laryngeal wall and the free margin of the membrane continued extremely small—about the tenth of an inch—and the patient could resume her occupations; there remained, however, complete aphonia. The patient took 616 grains of potassium iodide (40 grammes) during the first six weeks; it was then discontinued, and during the last five months her condition has remained stationary.

In narrowing of the larynx by membranous cicatrices, the voice is always impaired, and there also always exists dyspnoea; but the latter is not always in direct proportion to the extent of the membrane and the consequent contraction; for we have in some cases excessive occlusion (stenosis), with but slight dyspnoea, owing to the influence of habit and the slowness of the process; while in others dyspnoea may be intense, with only slight narrowing, but supervening rapidly. In the present case the considerable concentric swelling of the laryngeal mucous membrane was a fertile source of dyspnoea, which diminished as the swelling subsided. The true cords are, in most cases, the seat of these membranous cicatrices, by which they are either partially approximated or wholly united, so that they become nearly obliterated. The opening left by the membrane is mostly situated in the posterior portion of the glottis, and is rounded or semilunar. In one case (Navratil) the opening was situated in the middle of the membrane. As to the origin of the membrane, it is always the result of the healing of ulcerated and opposed surfaces coming into more or less continuous contact, be the healing spontaneous, or the result of appropriate treatment. The actual process of the formation, and the time occupied thereby, have only been observed once before, and in the present case. In the former case, described by Rossbach (Langenbeck's *Archiv*, vol. ix.), there was syphilitic ulceration of the cords near the commissure, and about the right arytenoid cartilage. Under treatment, the

ulcers healed; but within eight days the cords became united by a membrane in their anterior two-thirds. In the present case the anterior third of the cords was united after fourteen days' treatment, and the union became complete after five or six weeks. It will, therefore, always be a matter of practical importance in the treatment of syphilitic cases to institute an energetic and rapid anti-syphilitic treatment on the first appearance of redness and swelling about the anterior commissure of the vocal cords; for if ulceration have once commenced, more or less extensive union is almost necessarily a consequence of cure. If cicatrization and union have actually taken place, the only alternative of operative treatment remains. The division of the membrane may be effected by means of a fine probe-pointed bistoury. But a simple incision is followed in many cases by only temporary results. The galvanic cautery, or caustic potash, will probably be found more effectual in procuring a permanent destruction of the membrane, but even the most favourable result will scarcely obtain a restoration of the voice; dyspnœa will, on the other hand, always be removed. The patient in the present case has not consented to an operative treatment: want of voice being her only affection, and to this she attaches no particular value.—*London Med. Record*, May 15, 1878.

Enterotomy.

Dr. VON LANGENBECK, at the late congress of the Society of German Surgeons, showed a patient on whom he had performed enterotomy last May, and who wore an India-rubber bladder as an obturator to the artificial anus. He called attention to the importance of providing a sufficient closure for the new opening. In a case of colotomy, performed on a child for absence of the rectum, and which was in other respects successful, death had occurred from prolapse of the intestine, in consequence of the want of a proper obturator.

Dr. TRENDLENBURG (Rostock) had performed enterotomy three times, and considered it much less dangerous than colotomy, in consequence of the injury to the soft parts being less. For the closure of the fistula, remaining after gastrotomy, he recommended a drainage-tube provided with a stopcock, which could be fixed securely in a perpendicular direction by means of a ring of cork.

Dr. CZERNY (Heidelberg) thought that, independently of the connection in size between the prolapsed portion of bowel and the opening, the prolapse was always absent, or very small, when there was adhesion of the serous membrane above the opening.

Dr. VON LANGENBECK said, in order to prevent misunderstanding, that in the case of the child to which he had referred he had not performed Amussat's operation, but had opened the flexure of the colon. He had made the opening very small, and he believed that the prolapse was the result of invagination. A means of preventing prolapse, not unattended with danger, but certain in action, was the use of a plug to be inserted into the intestine. One of his patients had for some years used this plan with success.—*Lond. Med. Record*, May 15, 1878.

Laparotomy under Lister's Antiseptic Method.

Dr. CZERNY (Heidelberg) related, at the late congress of the Society of German Surgeons, ten cases of laparotomy which he had performed, in which, in spite of the use of antiseptic dressings, he had not in all cases been able to insure an aseptic course. Of six cases of ovariectomy, one patient died of septic peritonitis, following sloughing of the pedicle, which was ligatured and returned into the abdomen. For ligature he used silk treated with carbolic acid; in the remaining five cases, in all of which the pedicle was returned and drainage was not applied, this ligature

answered well, and was absorbed. Removal of the peritoneal exudation and washing out the abdomen with disinfectants produced some improvement, but failed to ward off death. In two cases of supravaginal hysterotomy for uterine myomata, in which the pedicle was fixed in the abdominal wound, in a case of slow peritonitis following an operation done in consequence of a wrong diagnosis, and in a case of unsuccessful attempt to remove a tumour lying in the neighbourhood of the bifurcation of the aorta, an aseptic course could not be obtained, although none of the four cases ended fatally.—*Lond. Med. Record*, May 15, 1878.

Operation for Strangulated Femoral Hernia, in which an Anomalous Obturator Artery was Divided.

At a recent meeting of the Clinical Society of London (*Med. Times and Gaz.*, May 25, 1878), Mr. BARKER read notes of this case. The patient, a woman of fifty-six, was operated on in the usual way on February 7. Most of the constricting fibres were easily divided; but, on severing some which remained, embracing the neck closely, blood welled out of the wound. The latter was enlarged and the vessel sought. As it could not be found and the bleeding soon ceased to be severe, it was deemed advisable to apply pads over the wound and compress with bandages. On the 8th the patient was better, and on the 9th better still. Early on the morning of the 10th, however, she took a turn for the worse (indicating peritonitis), and died at 5 P. M. on the same day. A post-mortem examination revealed acute peritonitis with serous effusion. Near the wound, about three or four ounces of blood were found effused underneath the peritoneum in the pelvis, above and to the right side of the bladder. This blood came from an anomalous obturator artery passing down on the inside of the neck of the sac. It sprang from the epigastric about half an inch from its origin, and was completely severed at about three-fifths of an inch from its commencement. Its vein lay to the outside of the sac. The proximal end was plugged; the distal had furnished the bleeding. Mr. Barker had remarked that his object in bringing the case before the Society was not only that it was a rare one, but that he hoped to elicit an expression of opinion from the members as to the best mode of dealing with cases where this rare accident had occurred. Was the artery to be sought at all costs, and ligatured; or was it, in certain cases, as in this, to be left to itself controlled by pads? He had, with a good deal of trouble and search through English and foreign literature, succeeded in collecting only twelve cases where this accident had occurred; excluding doubtful cases where no correct record had been given. Out of these, he said, it was remarkable that in six the vessel was secured with ligature or hook, and in six it was left to itself. Of the first six, two died; and of the second six, one (the present case) died of peritonitis. Without desiring to make too much of these facts, he thought that the one line of practice was at all events justified as well as the other, although in some books very positive statements were made as to the urgent necessity of seeking the artery and placing a ligature upon it.

Mr. CALLENDER said that he personally had only once seen such a case, and that was one of those mentioned by Mr. Barker, which had been under the care of Mr. Stanley. The artery in that instance was tied, and the patient did well. He had encountered hemorrhage in some of his operations for femoral hernia, but had always stopped it by local pressure. When the cases recovered, it was difficult to say whether the blood came from a wounded obturator artery or from a vein. In the six cases of wounded obturator artery which were ligatured, Mr. Barker, who had collected them, had said there were two deaths; that proportion of fatal cases was not much greater than the deaths after ordinary operations

for strangulated hernia. He thought each case should stand on its own merits. In some, pressure would suffice; in others, the subcutaneous fat, etc., being pushed aside, the artery might be tied. In some cases, however, it would be very difficult to find it.

Mr. HUTCHINSON thought also that each case should stand on its own merits. In the present case, did Mr. Barker think there was any secondary hemorrhage? If not, the cause of death was evidently peritonitis. What was the method adopted for applying pressure? He advocated the plugging of the wound by a sponge with a silk thread tied around it, dipped in alcohol, and then thrust deeply into the wound, as generally the best method of arresting the hemorrhage. He had had no case of wound of the obturator artery. Possibly, if the patient were thin, the artery might be tied; in other cases, pressure should be applied.

Mr. MAUNDER said he was personally grateful to the author for the valuable information conveyed in his paper. Hunting up statistics was always more or less irksome and distasteful, but Mr. Barker had done this very efficiently, and had clearly indicated the line of treatment to be adopted. Doubtless an individual case must be treated on its own merits, and in an instance of severe hemorrhage the bleeding vessel might be sought for. Failing to find this, compression must be resorted to, and in order that it may be effectual the compressing body should be applied through the wound and upon the actual source of the bleeding. In the author's case, the patient being stout, and the mode of compression being indirect, all the soft parts of the region intervening, pressure had probably very little to do with the arrest of bleeding; nature proved equal to the emergency.

Mr. BARKER, in reply, said that he had purposely excluded in his statistics all cases in which there was any doubt as to the source of the hemorrhage. In some books it was emphatically stated that the artery should be ligatured; so said Mr. Hey, Mr. Lawrence, etc. In his own case, at the necropsy there appeared to have been only a small amount of secondary hemorrhage. The pressure was applied externally, and the wound was not plugged, as the external pressure seemed to be enough.

Urethritis following the Use of Arsenic.

M. SAINT-PHILIPPE publishes in the *Gazette Médicale de Bordeaux* two cases in which the internal administration of arsenic was followed by urethritis. The first was a man aged 40, suffering from malarial fever, for which arsenic was prescribed. He had, however, taken but a small dose (.16 grain) of the remedy when he exhibited all the signs of poisoning. The following day he was attacked by urethritis. He positively affirmed that he had not been exposed for more than two months previously. The other patient was put upon arsenic for some skin-trouble, but owing to a mistake he took double the dose ordered, so that at the end of eight days he had taken sixteen milligrammes (.64 grain). Symptoms of poisoning now showed themselves, and at the same time the commencement of a well-marked urethritis, which yielded to the usual treatment in fifteen days. Here, again, exposure was denied for a long time previously, and, taking this case in conjunction with the foregoing, M. Saint-Philippe was forced to admit an arsenical urethritis; nor does he deem it illogical to suppose that arsenic, while being eliminated with the urine, may produce effects similar to those produced in the digestive tract and on the skin, where it is also eliminated. As, however, this is a toxic rather than a physiological irritation, the poisonous, instead of the simple therapeutic action of the drug, is necessary for its production. Hence it is rarely met with in practice. This form of urethritis resembles that caused by certain substances known to have a very marked irritant action on the genito-urinary mucous membrane, such as cantharides, certain balsams, and even beer and alcohol in excess.—*Lond. Med. Record*, May 15, 1878.

Five Hundred Cases of Operation for Stone in the Bladder of the Male.

At a recent meeting of the Royal Medical and Chirurgical Society Sir HENRY THOMPSON read (*Med. Times and Gaz.*, March 23, 1878) an account of 500 cases of operation for stone in the bladder of the male adult, with remarks on the most important incidents which occurred in connection with them. The 500 cases were in adult males—that is, of twenty years old and upwards—the great majority being from fifty to seventy years; the mean age sixty-one and a half. They comprised the author's entire and unselected work, from the first case up to January, 1877. The published experience of Cheselden, Martineau, Brodie, and Fergusson is recorded: the sum of similar cases treated, by number 422. Of these 422, 69 were fatal, or $16\frac{1}{2}$ per cent. (*i. e.*, one in rather more than 6 cases). Of the 500 cases in question, 422 were by lithotrity, and 78 by lithotomy. The number of individuals operated upon was 420; several of the lithotrity patients being operated upon twice, a few three times. In all cases a considerable interval and evidence of fresh formation, mostly a newly descended uric acid calculus, had existed. Small phosphatic concretions, although removed by lithotrity, had not been reckoned as stone in the bladder. The chemical constitution of the calculi was given as follows: Uric acid, 313; phosphatic, 99; mixed, 81; cystic oxide, 1; pure phosphate and carbonate of lime, 2; phosphatic calculi formed on foreign bodies, 4. The mortality, accepting almost any death occurring within six weeks of the operation, was—in the 422 cases of lithotrity 32 deaths, or one in 13, and in the 78 cases of lithotomy 29 deaths, or 1 in $2\frac{3}{4}$, giving a total of 500 cases with 61 deaths, or 1 death in $8\frac{1}{2}$ cases. The causes of death given in each case were tabulated, compared, and contrasted in the two operations, with inferences thereupon. The accidents met with in operating by each mode were also detailed, and the manner in which they were dealt with. The general inference arrived at was, that it is unwise to apply, as a rule, lithotrity to any stones above moderate size; and if any calculus is sufficiently large to require what is known as the fenestrated instrument, it is better to employ lithotomy. The author had not employed such an instrument during the last ten years. Finally, the after-history of patients who had been operated on by lithotrity was remarked upon.

Mr. CADGE, of Norwich, said that the paper prompted the question, What are the relative values of lithotomy and lithotrity in operative proceeding? The time had finally come when the mortality of lithotrity might be estimated. Sir Henry Thompson's experience gave a mortality of 32 out of 422 cases, or in all 8 per cent. Taking the experience of Brodie, Fergusson, Liston, Keith, his own, and the author's, there were 892 cases with 74 deaths, giving a total mortality of 8 per cent.; and this might be taken as the average mortality after lithotrity. In lithotomy the author admitted a mortality of 20 per cent., but this was hardly a fair comparison, for if Mr. Crosse's Norwich tables were taken, the average age was higher than in Sir H. Thompson's cases, and the death-rate as much as 31 per cent. This certainly showed that in all patients above fifty the immediate danger from lithotomy was very much greater than from lithotrity. But in cases of lithotomy the stone was usually larger and heavier, and this was an important factor in the case. The result was that the total mortality had been reduced in all cases from 31 to 12 per cent. His own experience tallied closely with this. He had operated in all on 220 patients—on 134 by lithotomy, on 86 by lithotrity. In lithotomy 104 were adults and 30 below twenty years of age; of the former 20 per cent. died; of the lithotrity cases 8 died. Recurrence of the stone was, however, rare in lithotomy; in 700 operations Crosse found only 12, and this appeared to be due to leaving fragments behind; but this recurrence was compara-

tively common in lithotrity, and was one of its chief defects. Another was the cystitis which was often left after lithotrity, and which Sir H. Thompson considered unavoidable, and due to fragments or the repeated use of instruments. A more frequent cause was, however, sacculated bladder from enlarged prostate and accumulation of matters in the bladder. The formation of stone in the bladder was exceedingly rare; when such did form it was usually from the remains of a former calculus. Then, after operation, there were not only those who died or recovered, but those also in whom the stone remained, and he thought this list much longer in lithotrity than lithotomy. And notwithstanding the fact that such was the case, he thought lithotrity an enormous boon.

Sir JAMES PAGET thought it was now fair to compare the results of lithotomy and lithotrity, but he confessed to a general feeling in favour of lithotomy. The main ground of his preference was expressed by the list of those who neither died nor recovered after lithotrity. He thought that those cases of cystitis where death ensued within twelve months should be included in the mortality if the cystitis could be clearly traced to the operation. The two operations ought to be fully compared in every possible way, including the pain and suffering after lithotrity and the not unfrequent recurrence of stone. Moreover, it was doubtful, after all the improvements made by Sir H. Thompson, if any further were to be looked for in this direction for some time to come. There was much scope, however, in the after-treatment of lithotomy and in carefully selecting patients. Were he to begin surgical work again, he would adhere to lithotomy, using lithotrity for cases where the stone could be got rid of in a few sittings. He was sure the mortality after lithotrity could be reduced one-half.

Treatment of Hydrocele by Electricity.

Signor MACARIO reports (*Gaz. Med. Ital., Lombard.*, No. 36, 1877) two cases of hydrocele treated by a single application of an electric needle for the space of one minute. One of these cases was permanently cured; the other was only temporarily cured, the disease returning after ten months. In both instances the fluid entirely disappeared in the course of twenty-four hours, though no fluid escaped through the wound made by the introduction of the needle. Macario recommends the employment of this method in other kinds of cysts, especially for ovarian cysts, and cites three cases that have been published as cured by this means.—*Practitioner*, May, 1878.

Disarticulation of Hip.

Towards the end of 1877, M. VERNEUIL communicated to the Academy of Medicine in Paris a paper on this subject, with remarks on the operative proceeding and mode of dressing. This paper became the starting-point of a long discussion, in which all the surgical celebrities of Paris have in succession taken part. Disarticulation of the hip, says M. Verneuil in his memoir, will always involve a grave prognosis, on the one hand by reason of the dangers inherent to the conditions which necessitate it, on the other by reason of the traumatic accidents to which it is exposed by reason of the extent of the wound. "Death," he adds, "is sometimes immediate, on the operating-table itself; sometimes rapid in the first five hours; sometimes approximate within two hours. At other times, it occurs after the first seven days, or later. Early deaths are by much the most frequent, ordinarily caused by the hemorrhage which precedes, accompanies, or follows the operation, and which proceeds not only from the femoral artery, but also from the branches of the gluteal and the sciatic arteries. Later deaths are most frequently the result of blood-poisoning." M. Verneuil then attempts

to discover, first, what is the mode of operation most calculated to realize economy of blood; and, second, what is the mode of dressing which affords the best precaution against the accidents of infection. To reduce the loss of blood to its minimum, the best method, according to M. Verneuil, consists first in pushing back into the system the blood contained in the limbs by means of the elastic bandage; then removing the thigh as if one were proceeding to remove a voluminous tumour, by exposing and tying the principal vessels before dividing them. This method of proceeding was followed for the first time by M. Verneuil in 1864. To prevent septicæmia in its diverse forms, acute, chronic, or pyæmic, M. Verneuil considers it essential to prevent the discharges from stagnating in the wound, too favourably disposed to retain them; and useful, if it be possible, to prevent changes in those fluids. Primary union, adopted by all surgeons and held in view by all the inventors of operative methods, is, he considers, unfit to fulfil the two former conditions; it favours rather the alteration and retention of the fluids, even if only in the cotyloid cavity. It ought, he advises, to be abandoned. For the same reason, M. Verneuil abandons the lateral oval proceeding, and the operation by the anterior flap, which favours retention of the fluids, and prefers an open wound largely exposed, such as he obtains by the "racquet" method. The following are the different stages of this procedure. In the first stage, an incision is made in the skin—a vertical incision from 2 to 2.4 inches, starting from a finger's breadth below the crural arch; and from the inferior extremity of this is made an incision which crosses obliquely the external surface of the great trochanter, and is continued along the gluteal fold. The second stage consists of opening the sheath of the vessels; preventive ligature of the femoral artery above its bifurcation, and ligature of its two branches *en masse* to avoid the reflex hemorrhage by anastomosis; and section of the veins between the ligatures. The third stage consists of section with the bistoury of the muscles of the anterior region. The vessels compressed in the muscular interstices are only divided after previous ligature. In the fourth stage, the joint is laid open. The first stage consists of division of the posterior muscles and of the vessels with the same precautions. The operation may be terminated in half an hour. The wound is open, and shaped like a hollow cone. As to dressing, M. Verneuil employs small squares of tarlatan soaked in water, on which are applied small feathery masses of charpie dipped in antiseptic liquids, which are covered with a thick layer of cotton-wool. The whole is kept in place by a piece of oiled silk as simply arranged as possible. The dressing (*à la Lister modifié*) is rearranged every morning.

All the surgeons who followed M. Verneuil in the discussion admitted the originality of his method. M. Roche, however, observed that Marcellin Duval had already previously substituted the bistoury for the knife; but his proceeding differed essentially from that of M. Verneuil, in that the vessels were not tied until after the operation. M. Terrillon preferred the external oval method; he compressed the aorta and tied the vessels as he proceeded with the section. M. Richet recommended direct compression of the open arteries by the aid of large sponges, soaked, if desired, in hæmostatic fluids. Two operations performed with these precautions—one in 1850, and the other in 1864—ended both successfully; whilst a first disarticulation, performed in June, 1848, resulted in considerable hemorrhage and the death of the patient in forty-eight hours. M. Trélat compressed the iliac and performed preliminary ligature, or prompt ligature of divided vessels, whilst an assistant compressed the whole base of the anterior flap. As for the posterior flap, "what prevents us," he asked, "from proceeding slowly and applying the hæmostatic forceps to every branch which gives blood?" M. Legouest had three times performed disarticulation of the thigh, and had as-

sisted at an equal number of operations. The first of his patients died at the end of four months; the second, at the end of forty-eight hours; and the third, at the end of fifteen days. In the first and third operations, there was abundant hemorrhage. M. Legouest advised the prevention of hemorrhage from the femoral and its branches by employing the procedure by the anterior flap, and tying immediately the vessels which it contains. Having uncovered the articulation, he disengaged the head of the femur; and, separating it from the pelvis, he passed behind it the flat of the knife, so as to divide at the same time the posterior soft parts in front of the hands of an assistant who compresses them, stopping to tie the vessels as they are opened. Finally, M. Lefort was of opinion that the sometimes abundant hemorrhage which often accompanies this operation is not the principal cause of the rapidly fatal result. This frightful mutilation, by cutting off almost a fourth in weight of the body, carries with the limb a quantity of arterial and venous blood greater than that of which even abundant hemorrhage may cause the loss. This loss, added to that which occurs by the vessels which the surgeon opens, augments in a formidable proportion the gravity of the operation; and to this must be added the modification which must occur in the hydrostatics of the circulation by the removal of so considerable a part of the body. The relative benignity of disarticulation in patients whose thighs have already been amputated at a more or less distant time, the successful employment of Esmarch's bandage, and the observations of Joseph Bell at the Royal Infirmary of Edinburgh, have led M. Legouest to insist upon this particular part of the question. The economy of blood deserves, then, the attention of all surgeons in performing coxo-femoral disarticulation; and it follows from the communications of all those surgeons, that it is absolutely indispensable to employ every means capable of lessening loss of blood either as a preventive or definite means.

M. Gros of Nancy, in reviewing this long debate in the *Revue Médicale de l'Est*, which is the organ of the new University at Nancy, calls attention to the very complete memoir recently published on coxo-femoral disarticulation by Dr. Lünig of Zürich (*Ueber die Blutung bei der Exarticulation des Oberschenkels und deren Vermeidung*, Zürich, 1877). Dr. Lünig, he pointed out, had collected four hundred and ninety-seven observations on disarticulation of the hip, in which the mortality is as high as 70 per cent.; but it has been ameliorated of late years. It is greatest in operations performed for wounds by firearms, and hardly better in operations performed for ordinary injuries (71 per cent.); more favourable in operations performed for pathological lesions (42 per cent.); and most so in cases of reamputation (40 per cent.) In two hundred and thirty-nine operations having a bad result, and in which the date of death is exactly known, Dr. Lünig has noted that in 5 per cent. of the cases the patient has succumbed during the operation; in $12\frac{1}{2}$ per 100, within one hour; in 26, within five hours; in 46 per 100, or nearly one-half of the cases, within the first day; in 57 per 100 of the cases, within forty-eight hours; and, finally, in 70 per 100 of the cases, before the fifth day.—*British Med. Journal*, April 27, 1878.

Treatment of Aneurism of the Aorta by Electro-Puncture.

At the meeting of the Paris Société de Thérapeutique on March 13th, M. DUJARDIN-BEAUMETZ stated that this method of treatment was becoming general in France. Since last July, the operation has been performed three times; on two patients in M. Potain's wards, and on a patient of M. Ball's. A very marked improvement was obtained by this method in all the cases. The aneurisms were all of the thoracic aorta—two were seated at the origin of the aorta, and formed sacs occupying the left side of the thorax; a third was situated at the

dorsal region, and originated in the descending portion of the arch of the aorta; in the latter case, the tumour was the cause of paraplegia. Five applications were made at intervals of three weeks, and produced a diminution in the paraplegia, and a great lessening of the pulsations. These aneurisms were not accompanied by any cardiac change. The method of operation was the same in all the cases; positive currents only were used on the needles inserted in the tumour, the negative pole being applied on the thigh. M. Dujardin-Beaumetz is inclined to believe that electricity acts here by setting up inflammation on the sac rather than by directly bringing on coagulation of the albumen and fibrin. He thus explains the tardy setting in of improvement, which only comes on from a week to a fortnight after the application of electricity. Summing up the facts known up to the present time, M. Dujardin-Beaumetz is of opinion that, taking the harmlessness of electro-puncture into consideration, this plan should take its place in ordinary therapeutics, and that it is the best of all treatments recommended up to the present time; he, however, acknowledges that ice and iodide of potassium must first be tried. Ice applied externally also acts by setting up inflammation in the sac, and not by directly coagulating the blood; it has, in fact, been demonstrated that cold retards coagulation of the blood. Iodide of potassium administered internally is the only remedy which has afforded certain cures. At the same meeting, M. Paul stated that he had recently seen a case of aneurism of the brachio-cephalic artery in a syphilitic patient, which was cured by the use of iodide of potassium. M. Edouard Labbé also pointed out that M. Potain had observed an analogous case. M. Bacquoy also mentioned that he had seen two cases of very remarkable improvement in aneurism of the aorta, by the use of iodide of potassium and ice. —*British Med. Journal*, May 4, 1878.

The History of Complete Extirpation of the Scapula.

Dr. VON ADELMANN (Dorpat), at the late Congress of the Society of German Surgeons, read a paper on sixty-one cases of total extirpation of the scapula which he had collected, and commented on the principal clinical facts. He remarked that it was an especially encouraging fact that this operation, formerly feared as very dangerous, had been performed with comparative frequency during the last twenty years, with good results.—*Lond. Med. Record*, May 15, 1878.

Extirpation of the Scapula and a Portion of the Clavicle.

In the *Archiv für Klinische Chirurgie*. Band xxi., Dr. NEDOPIL describes a case in which this operation was performed by Dr. Billroth.

A man, aged 44, had a tumour on the scapula. It first began to give trouble three years before the patient came under treatment, and had extended into the supraspinous and infraspinous fossæ, to the neighbourhood of the coracoid process, and into the axilla. An exploratory puncture having been made, and a portion removed, the diagnosis of myxochondroma was made.

The operation of removal was performed in the following manner: The tumour was first laid bare by an incision nearly corresponding to the median border of the scapula; from the upper end of this, a semilunar incision was carried outwards over the acromion, and then inwards and downwards over the coracoid process. It was now found that the arm could be preserved. The shoulder-joint was laid open from above, and the arm drawn out; the tumour was then separated from its muscular connections, proceeding from before backwards. As the lower angle of the scapula was found for a length of more than three inches, it was separated by means of bone-forceps from the diseased part and preserved, while the greater part of the scapula, which was involved in the growth, as well

as the acromial end of the clavicle, around which the tumour had grown, were removed. Drainage-tubes and sutures were applied, and antiseptic treatment was followed. At the end of three weeks healing was complete, except at a small granulating surface at the point of drainage. Six weeks after the operation, the head of the humerus had formed an articulation with the outer end of the clavicle and the remaining portion of the scapula, and could be actively rotated inwards and outwards, the *teres major* and *teres minor* having been preserved. The movements of the forearm and hand were powerful.—*London Med. Record*, March 15, 1858.

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Resection of the Ribs in Cases of Retrocostal Abscess.

Dr. LOSSEN, Professor of Surgery in Heidelberg, writes in the *Berliner Klinische Wochenschrift* for March 4 that resection of the ribs in retrocostal abscesses was first recommended by Roser in 1859. His object was the permanent dilatation of the empyematous fistulæ, which usually show a strong tendency to contract, principally through the close approximation of the adjacent ribs, whereby the introduction of tubes and canulæ is rendered well nigh impossible. A case of empyematous fistula of eight years' standing was thus treated by Roser in 1865, after which it rapidly healed in fourteen days. In 1869, Simon excised a portion of the sixth rib in a case of empyema with fistula (*Berl. Klin. Wochenschrift*, 1876, No. 19), with the object of permanently dilating the canal. After a few weeks the edges of the wound again came so close together, that only a fine sound could be introduced. At the same time, however, the suppurating cavity had become much smaller, and ultimately became completely obliterated, while there remained a marked sinking in of the sixth rib. This led Simon to the conclusion that the sinking in of the rib was the immediate cause of the closing of the cavity, which was before impossible, owing to the rigidity of the walls; for the ribs, with their cartilages and attached muscles, form a pretty rigid external wall to the pleural cavities, whose dimensions can only be altered by elevation or depression of the ribs, but not by any change in the curvature of the individual ribs, which is impossible. In long-standing empyema, the affected side of the thorax is in the condition of expiration. The ribs are depressed and still further approximated by adhesions, and even in immediate contact. The posterior wall of the cavity, being formed by the lung, is, on the contrary, more movable and less resistant, provided the lung itself is not tied down to the neighbouring thoracic wall by adhesive bands. If we now remove a portion of the costal arch, the walls of the cavity can approach and come into contact; and the abscess heals. Three cases thus treated within the last few years by Stehberger and Peitavy by section of the ribs, bear out this view, which is also confirmed by the following case. In October, 1878, a young lady, nineteen years of age, presented herself with a fistulous opening on the right side of the thorax. When she was two years old, an abscess had formed in this situation, from which, when opened, a large darning needle was removed. How the needle had come there could never be made out. In spite of all treatment a fistulous opening remained, with a constant discharge of pus. It was so narrow that only a fine probe could be introduced. Dr. Lossen, therefore, removed a piece about two-thirds of an inch in length, of both the sixth and seventh ribs, whereupon a cavity of the size of a fist was reached, containing a considerable quantity of thick pus, and extending towards the axilla. Under a treatment consisting of carbolic injections, drainage, etc., the cavity diminished considerably, and the adjacent ribs sank inwards, while the patient, whose general health had latterly become much impaired, improved in every respect. In March, the ends of the ribs had approached so closely by cicatrization that it became extremely difficult to keep the sinus open for the purpose of injection, while, at the same

time, there clearly still existed behind it a pouch nearly two and one-half inches (six centimetres) in depth. Consequently Dr. Lossen further removed, on April 10th, a piece about one and two-thirds inch long from the upper rib, and a piece about one and four-fifths inch from the lower one, whereby almost the entire cavity was laid bare. The patient now did well; the ribs were drawn still further inwards, while a few small pieces of bone came away through the now shallow opening. The case is instructive, as showing the mode in which a radical cure was effected; and the necessity for a second resection proves the importance of removing a fairly large portion of the rib.—*London Med. Record*, May 15, 1878.

Disarticulation at the Knee-joint.

Dr. VON LANGENBECK showed, at the Congress of the Society of German Surgeons, two patients on whom this operation had been performed. Under the present system of dressing wounds, it was attended with much less danger than amputation at the lower part of the thigh, and the result as regarded utility of the limb was very good. Disarticulation at the knee was indicated in cases of entire or partial destruction of the joint, and in cases of injury of the leg not implicating the knee. In the first case, the leg being strongly bent, the articular surfaces of the femur were simply removed. He had performed this operation three times since 1851, with satisfactory results in all the cases. The operation had been done by him in seven cases with uninjured joint since 1871; in the case now shown the patella had been preserved. He submitted the question of the preservation of the patella, in cases where the knee-joint was uninjured, to the Society for discussion; as, even under antiseptic treatment, the bursa of the quadriceps could not remain unopened, but must be drained. He would always remove the patella along with the bursa and the whole of the capsule, although in his seven operations he had had two deaths, as well as a case of pyæmia.

Dr. UHDE (Brunswick) who had had twelve cases of amputation at the knee, as well as several of disarticulation at the elbow, recommended the preservation of the patella. He had lost only one or two patients; all his cases of disarticulation at the elbow had recovered.

Dr. LÜCKE (Strasburg), who had seen sloughing at the anterior flap in two cases of amputation at the knee-joint, asked whether this might be obviated by leaving the patella, or whether any other method than that by anterior flap could be followed.

Dr. SCHEDE, who remarked that amputation at the knee-joint was not sufficiently practised in Germany, believed that in it healing by the first intention was insured by antiseptic treatment, and that it was seldom if ever followed by atrophy of the stump, such as occurred after amputation through the femur. With regard to the question of total extirpation of the capsule along with the patella, he was of opinion that the retention of the synovial membrane was of little importance, while on the other hand there was no special indication for removing the patella. The mortality after disarticulation at the knee-joint lessened yearly; according to Andrews, of Chicago, it was now not greater than that after amputation through the condyles.

Dr. VON LANGENBECK would perform disarticulation at the knee in place of amputation of the thigh high up, in cases where an artificial foot would have to be used. Differing from Dr. Uhde, who advocated Velpeau's modification of the circular incision, he recommended an anterior flap, the only disadvantage attending which was that the process of union by the first intention was liable to be disturbed by muscular spasm.

Dr. RIEDINGER (Würzburg) had seen sloughing of the flap in the last two

cases of disarticulation at the knee performed in Würzburg; one patient was a blooming girl ten years old.

Dr. THIERSCH (Leipsic) recommended the fastening of the patella with pegs as a means of counteracting muscular cramp. He asked Dr. Riedinger whether the sloughing in the cases to which he referred affected the entire thickness of the soft parts. Dr. Riedinger replied that it did.

Dr. VON LANGENBECK had as yet never seen sloughing of the flap. In reply to Dr. Thiersch's suggestion of fastening the patella, he said that he attributed the muscular spasms to the flexors rather than to the extensor quadriceps. He used antiseptic dressing in the after-treatment, but it did not entirely prevent muscular twitchings.

Dr. ROSER (Marburg) had done disarticulation at the knee four times without one death.—*London Med. Record*, May 15, 1878.

Epicondylar Fractures of the Humerus.

In the *Allgemeine Wiener Medizinische Zeitung* for February, Dr. E. ZUCKERKANDL says that the epicondyles, internal and external, or, as we should call them, epitrochlea and epicondyle, or internal and external condyle, are, when fractured, much more frequently observed in the living subject than the dead, as patients incurring such injury usually recover. Preparations are very rare. No drawing of one is to be found in Malgaigne's atlas, and, referring to the matter in the text, Malgaigne writes as follows: "Some modern writers have also spoken of a fracture not extending into the joints and only affecting the small projection of the epicondyle; but, as yet, no one has cited an example of it." Gurlt can only discover one example of fracture of the internal condyle, which is in the Würzburg museum. Hamilton has seen no specimens of epicondylar fracture, and does not think it possible to diagnose the existence of a fracture of the external epicondyle, and even doubts its occurrence. Before describing two cases which came under the author's notice, one of the external and the other of the internal epicondyle, Dr. Zuckerkandl refers to the anatomical peculiarities of the lower end of the humerus, that it is formed by the synostosis of five centres of ossification, the diaphysis, namely, which includes the supratrochlear fossa, a portion of the eminentia capitata on the ulnar side, and behind, a part of the trochlea; second, the trochlea; third, the eminentia capitata; fourth and fifth, the epicondyles themselves.

The projection of bone above the trochlea, serving for origin to flexor muscles, is, in the adult humerus, called internal epicondyle, but its development shows it to be composed in part by the shaft, and in part by the separate centre for the epicondyle proper, so that true epicondylar fracture or separation can only occur in the young person. The projection readily felt on the outer side, and called external epicondyle in the adult, is in reality the termination of the ridge of the shaft, on which posteriorly the centre and the external epicondyle unite.

The first case described by the author was a separation of the internal epicondyle in a fully developed man. On examination after dissection the injury proved to be a true epiphysary disjuncture, united by fibrous material to the shaft. The other case was one of fracture of the external epicondyle, and was also observed in an adult, but here there was a greater amount of separation, and less firm union of the fragment. The author gives figures which show that his cases were really epiphysary fractures or separations, and he adverts to Rumbaud and Regnault's views as to the tardy union of these apophyses with the shafts in some cases.—*London Med. Record*, May 15, 1878.

Intermittent Hydarthrosis of the Knee.

M. PANAS related to the Société de Chirurgie (*Union Méd.*, April 9; *Gaz. Méd.*, April 20) a case of double hydarthrosis of the knee, of a type of which he had never previously met with an example. It is not one of those recurring hydarthroses which return at variable epochs under the influence of the same special cause which gave rise to the first attack, but puts on an intermittent form as regular as that observed in intermittent fever. The subject is a woman twenty-two years of age, exempt from rheumatism, scrofula, or syphilis, who at the age of seventeen was delivered of an infant at full time and in good health. A fortnight afterwards she was seized suddenly with an indolent form of hydarthrosis in both knees, the fluid effused being sufficient to raise the patellæ very distinctly. This state of things lasted four days, when it all disappeared. A fortnight later to the day (always a Monday) the hydarthrosis again appeared, and lasted again four days; and so the affection kept on alternating during four years with the greatest exactitude. Twice during this time she became pregnant, once going to the full time, and once aborting, and on each occasion until delivery was accomplished the attacks were suspended, to recur after it at the same intervals as before. Of late they have continued longer, lasting a full week. During this long period all kinds of treatment had been tried without avail. When M. Panas admitted the patient into the hospital he was disposed to doubt her story; but he has since witnessed three of the attacks. Independently of the attacks, the joints seemed to have nothing the matter with them beyond a scarcely perceptible thickening around the synovial *culs-de-sac*, their movements being quite normal. Quinine and all other means have proved of no utility. M. Le Dentu remembers to have seen a somewhat similar case in Voillemier's service, occurring in the person of a young man, the hydarthrosis coming on every fortnight and lasting four or five days. In this case only one knee was affected, and the attacks came on with less regularity than in the case of M. Panas. After quinine and other remedies had completely failed, Voillemier practised transcurent cauterization over the joints and kept the limb immovable; and the patient was dismissed, at all events temporarily cured.

M. VERNEUIL stated that he had met with a case at the Lariboisière exactly similar to those narrated, occurring in a young woman who had to be dismissed uncured. About ten years ago, also, he was consulted by a wealthy gentleman from the country who had suffered from the affection during several years. He had formerly applied to Nélaton, who told him that so rare was his complaint that he had only once before met with an example. Quinine was given, and a cure effected which held good for six years. When he came to M. Verneuil, the intermittent hydarthrosis had returned for about a year, and quinine had been again resorted to, but without any effect. Energetic compression was methodically employed, but the patient did not return.—*Med. Times and Gaz.*, May 4, 1878.

OPHTHALMOLOGY AND OTOTOLOGY.

Transverse Calcareous Film of the Cornea.

Mr. EDWARD NETTLESHIP read a paper on this subject at a late meeting of the Royal Medical and Chirurgical Society (*Lancet*, May 4, 1878). The disease, a somewhat rare one, has been described by various authors, but chiefly in its local relations. The chief objects of the paper are to draw attention to some

points in the natural history of the disease which may throw light on its causation, and to confirm the statements of earlier writers, especially Dixon and Bowman, as to the good results of local treatment in suitable cases. A thin film of crystalline, chiefly calcareous, substance is formed beneath the anterior corneal epithelium; it can be chipped off in little flakes, leaving the underlying cornea clear. It is limited to the parts habitually uncovered by the lids, and when complete it forms a broad, nearly transverse stripe, terminating at each end a little within the lateral boundaries of the cornea. The symptoms, as a rule, are very slight, and there are generally no complications, even when the disease is of many years' standing; but sometimes chronic iritis and glaucoma come on, and occasionally ulceration takes place on the diseased patch. It seldom begins in both eyes at the same time, but is almost invariably symmetrical in the end. The film is formed slowly, and may continue to increase for some years. The disease is one of middle and advanced life, and its subjects, almost without exception, are males. Occupation seems to have no direct influence. The morbid tendencies of the patients, so far as they are at present known, lead the author to suggest that, in regard to causation, excess of uric acid in the blood furnishes the most likely explanation from the constitutional side, though local peculiarities, not at present understood, are necessary as determining causes. Several new cases with naked-eye and microscopic drawings are given. The paper is supplemented by abstracts of all the published cases (fifteen in number) known to the author, and in some of these (recorded some years ago by Mr. Fairlie Clarke) the present condition of the patients has been ascertained.

Mr. POWER thought most of the cases were referable to the gouty diathesis, the corneal opacity being also associated with accumulation of white matter along the borders of the lids. At the same time exposure to irritants might determine the corneal change. In several cases he had chipped off the thin film by means of a cataract knife. Mr. HUTCHINSON did not think the affection was so directly connected with the gouty diathesis as Mr. Power implied, and the first case he saw was one under the care of Messrs. Bowman and Dixon, and referred to by Mr. Nettleship in the paper. That case was at first thought to be gouty. Since then he had seen only two or three cases, and had not found them associated with gout. He suggested that, of predisposing causes, senility took first rank, and next, perhaps, gout, whilst no doubt other contributing causes, such as exposure to irritants, nerve-disorders, etc., might be present. He contrasted the condition in these respects with Dupuytren's contraction of the palmar fascia, which may be a senile change, or associated with gout, or induced in predisposed subjects by local inflammation, and he inquired whether this palmar fascial contraction was met with by Mr. Nettleship in many of his cases. Mr. NETTLESHIP, in reply, was interested to hear that Mr. Power had seen several cases of this affection. In none of his cases had he been aware of the presence of the condition of the palmar fascia referred to by Mr. Hutchinson, but he had not sought for it. Certainly it was never present so as to give rise to any discomfort. Since his paper was sent in he had seen another case in a female, and in this case only one eye was affected, although it had lasted for forty years. The patient was not gouty, but the urine was habitually loaded with lithates.

Removal of Piece of Iron from the Lens by means of a Magnet.

At a late meeting of the Clinical Society of London (*Lancet*, March 30, 1878), Mr. MCHARDY read notes of a case of removal of a chip of iron from the crystalline lens by means of a powerful magnet. The patient, thirty-one years of age, when at work, was struck in the eye by a fragment of steel from the hammer he was using. When seen, twenty-four hours after, there was evidence of com-

mencing iritis; there was nothing in the vitreous; the eye was less painful than on the night of the accident; its tension normal. Atropine drops were prescribed. The next day there was no pain, and less congestion of the eye; the pupil was well dilated, and allowed of detection of a sharply defined opacity on the anterior surface of the lens in a downward-inward direction from the centre, the peripheral end being nearer to the margin of the dilated pupil. The cornea was almost normal. The atropine was continued, and absolute rest enjoined. The removal of the chip appeared to be imperative, lest it should gravitate downwards; at the same time Mr. McHardy was unwilling to remove the lens, and he also thought if it were injured by the forceps it would not be easy to tell if any subsequent opacity of the lens were due to the original injury or to the operation. He therefore had a magnetic spatula constructed by Messrs. Weiss, intending to use it in connection with an electro-magnet. On Mr. B. Carter's suggestion, the procedure was modified by employing a powerful bar magnet connected with two Grove's cells. Gradually approaching it to the front of the cornea, when it was four inches away the chip sprang from the lens to the inner surface of the cornea, and fell into the anterior chamber, whence it was removed, together with a small portion of iris. A patch of opacity exactly corresponding in size to the chip was left on the lens. Subsequently a cataract formed, and the injured lens became absorbed. The patient's vision, aided by a lens of twelve dioptries, is normal for distant objects. Mr. McHardy acknowledged his indebtedness to Mr. Ladd and Dr. Tibbits for assistance and suggestions, and he referred to a paper by Dr. McKeown in the *Dublin Journal of Medical Science* for September, 1876, where three or four cases are recorded of the use of magnets in the removal of fragments of steel in the eye.

Mr. BRUDENELL CARTER, having seen the case, stated that the position of the fragment was such that any other attempt at its removal would have jeopardized the eye. If nothing had been done, the fragment would probably have fallen below the iris, and would have set up destructive inflammation; and any attempt at its removal by forceps would certainly have injured the lens. By withdrawing it from its bed and bringing it to the front of the iris, the magnet had obviated these difficulties.

Causes of Myopia.

At the International Medical Congress in 1877, M. HATTENHOFF reported as follows on the etiology of myopia. 1. The ordinary causes of myopia are heredity and ocular work, combined or singly. 2. Hypermetropia can be changed into myopia by ocular work. 3. The progress of civilization, and especially of education, tends to increase the amount of myopia. 4. The predisposition to acquired myopia is often hereditary. 5. In ocular work three factors are principally concerned in producing myopia—accommodation, convergence of visual axes, and oculo-cephalic congestion. 6. The conditions of age, circumstances, duration of work, nature of objects viewed, and state of visual apparatus, powerfully influence the development of myopia. 7. The prophylaxis of myopia includes individual hygienic measures at school and at home, which are in great part realizable by the united efforts of physicians and authorities. Among these measures may be reckoned the use of convex glasses for hypermetropes.—*London Med. Record*, March 15, 1878.

Amyl-Nitrite in Tinnitus Aurum.

MICHAEL (*Archiv für Ohrenheilkunde*) has found more or less improvement in nineteen out of thirty-three cases. In all cases in which benefit was derived

there was increase of the tinnitus during the inhalation, and decrease with the disappearance of the flushing of the face from the amyl-nitrite. Weber Liel obtained improvement in two. Urbantschitsch also found improvement in one case. The last-named gentleman saw the inhalations followed by collapse of some minutes' duration, and by hemiplegia of a very short duration. He advises the use of only one drop at first, either pure or mixed with alcohol, and suspends the application after a few inhalations, as the action of the drug increases for several seconds, and may come on very suddenly.—*London Med. Record*, March 15, 1878.

MIDWIFERY AND GYNÆCOLOGY.

Normal Pregnancy and Accouchement during an Extra-Uterine Pregnancy of Seven Years' Duration.

This somewhat rare combination of circumstances has been observed and recorded by Madame Rampin, an obstetric practitioner in Toulon. In 1870 Marie C., who had had a natural accouchement two years previously, presented all the signs of another pregnancy—suppression of the menses, turgescence of the breasts, progressive enlargement of the abdomen, etc. Several months later she was seized with acute pains resembling those of labour, but her attendants, after vaginal examination, declared that there was no pregnancy. These pains lasted three days, when they gradually passed off. At the end of six months the menses reappeared, the swelling of the abdomen fell considerably, and became almost painless, and, with the exception that there was slight prolapsus uteri and a sense of weight in the right iliac fossa, the patient enjoyed comparatively good health. In 1875 she again became pregnant, and, after a natural labour of three hours, was delivered of a living child. Madame R. then took advantage of the flaccidity of the abdominal walls to make a careful examination of the tumour, and was so enabled to diagnose positively the existence of extra-uterine pregnancy. In the beginning of 1877 Marie C. died of phthisis. At the autopsy was found, in the right Fallopian tube, a full-grown fœtus, mummified, and enclosed in a firm, dense sac.—*Glasgow Med. Journal*, May, 1878, from *Lyon Médical*, Nov. 25, 1878.

Traction of the Lower Jaw in Head-last Cases.

Dr. MATTHEWS DUNCAN, at a late meeting of the Obstetrical Society of London (*British Med. Journ.*, May 4, 1878) contributed a paper on this subject. He commenced by saying that by the traction referred to two objects were professed to be gained—flexion of the head and extraction. Attempts to secure these objects by the fingers applied to the fossæ caninæ were in vain, because the force in a right direction available by such procedure was of too small amount. Besides traction of the lower jaw, there were two other sources of power: first, pulling by the feet or otherwise through the spine; this was the paramount force: second, expression, which, by mere strength of the accoucheur's arm, might be estimated as from 30 to 40 pounds, or, using the weight of the accoucheur's body, might reach 100 pounds. The dangers attending spinal pulling and expression were very considerable. Those of the latter method were as yet but little known. Danger in head-last cases, where the base of the skull was in the brim of the pelvis, was not from compression of the cord, but from asphyxia and from inhalation of solid and fluid matters into the lungs. Speedy delivery was

often desirable, and lower jaw traction deserved consideration when there was obstruction requiring the use of force, and when the other forces were not sufficient. Injuries resulted in two of Dr. Duncan's four experiments with lower jaw traction; separation of the two halves of the bone in one case in which 58 pounds were suspended on it, and laceration of the inside of the mouth with distortion in another. The force applied through the lower jaw, acting as it did chiefly through the maxillary joints, was favourably applied for producing extraction, but not for producing flexion, because of the nearness of the joint to the centre of the head's motion, the bitemporal diameter (in a contracted brim). The whole force so applicable might be more than 58 pounds, and might certainly all be used in cases of dead children, or children certainly doomed to death, or in cases where the head was left *in utero*. Further experience was required to show how much could be safely used in a living fœtus. Lower jaw traction did not produce considerable flexion of the head. Flexional efforts were seldom required. The paramount dragging by the spine, as it acted in a case of contracted brim behind the centre of the head's motion, annulled or undid any slight flexion produced by the lower jaw traction. But spinal pulling could easily be made to produce flexion after the head's passage of the brim by giving it a proper direction; and at this time flexion was essential.

Causes of Puerperal Poisoning.

In a lecture at the Maternité (*Gaz. des Hôp.*, April 18), on "Some of the Causes of Puerperal Intoxication," Dr. HERVIEUX, after alluding to the reality of contagion, observed that another well-marked cause was overcrowding (*encombrement*), as shown by the different mortality observed in hospital and town practice. Of the operation of this cause he had had frequent proofs at the Maternité; for although M. Besnier, in his reports on the Paris hospital mortality, shows that for more than ten years the sanitary state of the Maternité has been excellent, this is entirely dependent upon the condition that all the beds of a ward shall not be occupied. Whenever, from circumstances, this condition has not been observed, puerperal accidents of more or less severity have invariably manifested themselves within from twenty-four to forty-eight hours. On the other hand, whenever the patients are isolated, a notable amelioration of their condition is as invariably produced; as is also the case when a patient is taken from a crowded place to one that is not so. We may establish a fundamental distinction between the effects of overcrowding and contagion. To overcrowding Dr. Hervieux attributes the generative power, and to contagion the propagative power. This opinion is quite as admissible as the theory of germs; for germs exist everywhere, while puerperal poisoning does not prevail everywhere. Overcrowding only exists in certain restricted localities, and it is in such that puerperal epidemics arise.

Another cause of propagation is the practice of post-mortem examinations. When, in 1860, M. Hervieux assumed the direction of the Maternité, imbued with the doctrines generally admitted at that period, he believed in the existence of an essential fever of a most mysterious and impenetrable origin, and pursued post-mortem examinations with ardour. But the more laboriously he worked in this direction, the more violent were the epidemics which broke out in the wards. In the belief that the autopsies might have something to do with this frightful mortality, he abandoned their performance, and a sensible amelioration ensued. But other reforms having been put into force at the time of the autopsies being given up, he thought that possibly he might have been mistaken in attributing these ill effects to them. He accordingly resumed them; but although they were accompanied by every available precaution, new catastrophes followed their resumption, as they also did on other occasions, when, at the solicitation of his

internes he had sanctioned them. The statistics of Prof. Spaeth, of Vienna, quite confirm this view of the poisonous effects of post-mortems; for while at the maternity of that city, where there are medical students, the deaths were 5.32 per cent., at the maternity for midwives they were only 3.47, the practising of autopsies being the only difference in the conditions of the two establishments.

M. Hervieux does not believe in the existence of true epidemic constitution as regards puerperal disease. There are, in fact, no puerperal epidemics in the literal sense of the word, it being entirely a question of locality. This is seen by the statistics of puerperal mortality occurring in the different hospitals of Paris during 1873-1876, showing that no parallelism whatever exists. For example, in 1873, while at St. Antoine, it was 6.56 per cent., 8.65 at Les Cliniques, 8.88 at the Hôtel-Dieu, and 9.81 at the Neckar, it was only 3.19 at La Charité, 2.91 at Beaujon, 2.38 at St. Louis, 2.09 at the Pitié, and 1.93 at the Maternité, and at the *bureaux de bienfaisance* it was only 0.29, and at the residence of midwives 0.93. These so-called epidemics are all questions of locality, independent of atmospheric vicissitudes, ozone, electricity, direction of winds, etc. They are dependent on the measures of internal organization, hospital hygiene, and persons; and these causes, so far from being occult and mysterious, and beyond our comprehension, are material, comprehensible, and removable. The following are the rules which Dr. Hervieux has followed since his appointment to the Maternité, and by the observation of which he has secured such favourable conditions: 1. Surround the *accouchées* by plenty of space, disseminating them as much as possible. 2. Spare them all examinations that are not rigorously necessary. 3. Isolate *accouchées* who are ill from those who are well; and those of them who are dangerously ill from those who are only slightly so. 4. Suppress all autopsies. 5. Prefer to the alternate occupation of the wards their continuous occupation, with as much dispersion of patients as possible. 6. Appoint special attendants for those who are dangerously ill. 7. Whenever an epidemic seems about to manifest itself, restrict the admissions, or even close the service.—*Med. Times and Gaz.*, May 18, 1878.

Treatment of Sore Nipples.

Dr. HAUSSMANN (*Berlin. Klin. Wöchenschrift*, No. 14) recommends the application of a five per cent. solution of carbolic acid for producing a speedy cure of fissured nipples occurring in women after confinement. He reports a case in which both nipples being thus affected suckling was almost impossible. Nitrate of silver and lead lotion had been applied in vain to several small ulcers and numerous fissures. Strips of linen, saturated with the carbolic acid solution, were then ordered to be placed over the nipples, and renewed every two or three hours; the dressing being removed and the parts carefully cleaned before the child was put to the breast. The first application was followed by considerable diminution of the pain; on the following day the fissures were found to be reduced in size, and the excoriations had disappeared. Two days afterwards the woman was able to suckle her child without difficulty, the fissures having completely healed, and there was no return of the symptoms. In another case a weaker solution was tried, but the effect was not satisfactory. A few applications of the five per cent. solution sufficed to produce a cure. The acid causes less pain than nitrate of silver.—*Med. Examiner*, April 25, 1878.

Rheumatoid Inflammation of the Joints in Women.

Mr. DAVIES COLLEY, Senior Assistant Surgeon to Guy's Hospital, narrates (*Obstetrical Journal of Great Britain*, June, 1878) six cases of what he con-

siders a definite joint-disease characterized by great pain and tenderness, and more especially by redness and œdema of the soft parts in the neighbourhood. It is accompanied in the earlier stages by febrile disturbance, which, however, I have never noticed to be considerable. Usually a mild attack is noticed in other joints before the inflammation, so to speak, concentrates itself in one particular locality. The diseases with which it may be confounded are erysipelas, phlebitis, or acute suppuration of the joint. In the latter case the mistake might lead to serious consequences. The surgeon might be induced to make a free incision, and thus convert an inflammation which would have undergone resolution into a lingering suppuration. From most cases of erysipelas the absence of vesication and a high temperature would form a sufficient means of discrimination. From phlebitis the absence of the cord-like induration of the veins would probably enable us to diagnose it, although the œdema in some of my cases resembled very much that which accompanies thrombosis. If I may form an opinion from the limited experience I have had, the prognosis is so far favourable in that the inflammation will probably go away without suppuration. The joint will, however, remain more or less bound by fibrous adhesions; so the patient must expect some impairment of the usefulness of the limb. As I have never had an opportunity of examining the condition of the joint after death or amputation, I cannot speak with confidence upon the pathological character of the affection. Judging from the absence of fluctuation in most of my cases, and the presence of superficial œdema, I have been led to think that the chief seat of inflammation is in the fibrous capsule of the joint rather than in the synovial membrane. If the latter had been primarily affected, I should have looked for effusion inside the articulation, and consequent fluctuation as in the ordinary form of synovitis.

With respect to the causation of the disease, it will be observed that in all the cases reported or mentioned there was reason to suspect uterine or vaginal irritation. Some had severe leucorrhœa; others were pregnant, and of these all but one for the first time. In two cases there was no statement as to pregnancy, but as they had been married a short time previously, it is probable that either pregnancy, vaginal discharge, or frequent sexual congress was the source of irritation.

I have said before that I have not seen such a disease in the male. The only exception I would make to this statement is in the case of carpal and tarsal disease. Here there is often much redness and œdema as well as acute pain, and such inflammations, without suppuration, are not infrequent in the gouty and rheumatic of both sexes. Moreover, I have never seen a case of joint affection like those I have narrated in the female, except when there was evidence of some vaginal or uterine irritation.

It may be alleged that these inflammations are merely examples of gonorrhœal synovitis in the female, and I am disposed to admit that there is some alliance between the two affections in respect to their reflex origin through the nervous system. In the male, however, we rarely see any other joint affected than the knee, and the disease resembles an ordinary synovitis. In the women whose cases I have narrated, the elbow was quite as often affected as the knee. There was, moreover, great œdema and redness, with little, if any, effusion into the joints. The subsequent history was also unlike what is observed in gonorrhœal rheumatism. I cannot lay much stress upon the absence of a history of vaginal discharge in most of my cases, as probably no questions were asked upon the point, and even if there had been, the answers would not be reliable, unless an examination had been made.

If it is supposed that there was some vaginal discharge in each of the cases, which gave rise to the joint inflammation, it can hardly have been an accidental coincidence that so large a proportion of them should have occurred in pregnant

women. I cannot find that works upon midwifery make any mention of the liability during pregnancy to such affections. Nevertheless, the facts which I have brought forward seem to show that pregnancy either directly caused the inflammation by some influence reflected upon the vaso-motor system, or indirectly assisted in its development in a patient suffering from gonorrhœa or leucorrhœa, by the debility due to the pregnant condition.

Nigrinism.

The above is selected from a large choice of names to indicate a condition the reverse of that which obtains in albinos. WORONICHIN (*Jahrbuch für Kinderheilkunde*, Band xi., Heft iv.) relates several cases of more or less complete nigrinism, of which the following is the most remarkable. A married couple, both slightly dark, had had two ordinary children, when the woman again became pregnant. Nothing unusual occurred while she was in this condition, and after an easy labour she gave birth to a girl, whose blackness struck all present with astonishment. The midwife gently informed the mother that the child would not live; but, as the child cried loudly and sucked well, a medical man was hastily called, who sought in vain for a malformation of the heart or liver. The child grew well, got her teeth early, soon learnt to walk, and, in her third year, was extremely lively and sensible. The skin was of a brownish-black colour, almost darker than that of a mulatto. The shape of the head and the expression were quite of the Caucasian type, and had nothing in common with the negro. The hair was black, but smooth and hanging—not woolly. Certain parts of the skin were of a lightish colour, namely, around the navel, behind the ears, between the fingers and toes, and about the genitals and the nostrils. The child is now eight years of age, is well grown and healthy, but is everywhere known as Black Mary. Two cases of partial nigrinism are also given; but these might with equal justice be looked upon as large nævi.—*London Med. Record*, March 15, 1878.

The Antiseptic Method in Ovariectomy.

Dr. CARL SCHROEDER, Professor of Obstetrics and Gynæcology in the University of Berlin, has just published in the *Berliner Medicinische Wochenschrift* a highly interesting and valuable communication on the subject of ovariectomy. From May 25th, 1876, to February 24th, 1878, he has operated in fifty cases, which he summarizes in a table, to which he adds comments. From the total cases, three must be deducted in which the patients were the subjects of cancer, and died, in consequence of the extension of that disease, on the tenth, nineteenth, and forty-fifth days after the operation. In the remaining forty-seven cases, there were seven deaths; *i. e.*, 14.9 per cent. of deaths and 85.1 of recoveries. On dividing, however, the table into two equal parts, it is found that (excluding the three cancer cases) the first twenty-four operations were followed by six deaths = 25 per cent., and the last twenty-three by only one = 4.3 per cent. This great reduction in the mortality, Dr. Schroeder says, may be attributed to improved skill on the part of the operator; but he attaches much greater importance to the avoidance of infection, which he regards as almost exclusively the cause of death after ovariectomy.

As regards the places where the operations were performed, thirty-three patients were operated on in the Lying-in Institution in Berlin, twelve in private houses, and two in the Charité Hospital. (The three cases of cancer all occurred in the Lying-in Institution.) Of the thirty-three patients in the Institution, only

one died = 3 per cent. ; while the mortality among the fourteen operated on elsewhere was six = 43 per cent.

Dr. Schroeder says that the low death-rate in the Lying-in Institution is very remarkable, when the circumstances are considered. The institution was originally a private house ; the wards are defective in their sanitary arrangements, and are always overcrowded by one-half of the normal number ; women with offensive discharges are often admitted ; and, under all the circumstances, the occasional occurrence of puerperal fever is unavoidable ; and hence a more unfavourable place for ovariectomy could scarcely be conceived. Yet, among thirty-three patients, there was only one death ; and this was not from infection, but from intraperitoneal hemorrhage, which proved fatal on the nineteenth day.

The key to this success, Dr. Schroeder says, lies in having so perfect a control over the persons and instruments concerned in the operation, that infection is warded off from the subjects of operation. The operations are performed in private rooms, into which parturient women are never admitted, and suppurating cases only rarely. The instruments to be used are always freshly cleaned by the instrument-maker, and allowed to lie in a five per cent. solution of carbolic acid ; the sponges are quite new, and are always most carefully cleaned and scalded on the preceding day by the head midwife, and placed during the night in solution of carbolic acid. At the operation, five persons are present besides the assistant who administers chloroform. The operator and one assistant only come into contact with the wound ; a second assistant has charge of the instruments ; the head midwife mixes the solutions and renders occasional assistance ; and a nurse stands beside the operator with a vessel containing carbolic acid solution. The head midwife is required to avoid coming into contact with all sources of infection ; and the nurse is detailed for duty in the ovariectomy wards exclusively. Dr. Schroeder and his assistants take the greatest pains to avoid all contact with infective materials.

The operation is always performed in the morning, before any other patients are visited : at half-past seven in the summer ; in winter, as soon as it is sufficiently light. On rising, Dr. Schroeder takes a bath, dresses himself so that his clothes may not convey infection, and washes in carbolic acid solution before proceeding to operate. At least half an hour before the operation, the carbolic acid spray is brought into play in the room ; and then, the patient having been washed in a pure atmosphere, the operators proceed to their work with clean hands and clean instruments. These precautions are, in Dr. Schroeder's opinion, sufficient to obviate the risk of peritonitis, which, in its generalized form, he holds to be the result of infection and not of injury.

Even in the most severe cases, and in those where the peritoneum was extensively interfered with, there was scarcely any reaction. The pulse, indeed, rose to 90 or 100 ; but the temperature never exceeded 100° Fahr., or sometimes on the first evening 100.4° ; not uncommonly it remained absolutely normal. Even in one very difficult case of suppurating cyst with extensive adhesions (followed by recovery), the temperature did not exceed 98.8° during the first ten days.

In a foot-note, Dr. Schroeder remarks that there is, as a rule, a fall of temperature, sometimes as low as 95° Fahr., immediately after the operation. This, however, has never been followed by any ill result. He has never seen indications of carbolic acid poisoning, nor has he found in any case carbolic acid in the patient's urine.

Vomiting, dependent on the anæsthesia, is very common on the day after the operation, and rarely continues beyond this. On the second or third day, the appetite returns. The dressings are allowed to remain nine days ; on the tenth, they are removed under the carbolic acid spray, and the sutures are taken out.

The wound is found to be united by the first intention, without the formation of a drop of pus. The pedicle is always returned into the abdomen, as the retention of it outside the wound interferes with the application of Lister's dressing. Silk sutures certainly irritate; but Dr. Schroeder does not know how to do without them, as catgut, he says, is not to be depended on, and he has no faith in the actual cautery. He used drainage of the peritoneum in only one case, and considers that it is never necessary, and sometimes even injurious.

This communication of Dr. Schroeder is a most valuable contribution to the settlement of the question as to the applicability and utility of the antiseptic method in ovariectomy. He heads his paper, "A Report on Fifty Listerian Ovariectomies (*Lister'sche Ovariectomien*);" but, though he describes minutely the antiseptic precautions employed, he does not give details as to the manner in which the wound is dressed—merely speaking of the "*Occlusivverband*." Anyhow, his results go to prove the applicability to ovariectomy, if not of Lister's method in all its minutest details, at least of a modification of that method.—*British Med. Journal*, March 23, 1878.

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Ovariectomy Performed on the Antiseptic Method, the Patient being in a State of Pyrexia; Recovery.

Dr. JOHN WILLIAMS, Assistant Obstetric Physician to University College Hospital, records (*Lancet*, March 16, 1878) the following case:—

Mrs. D—, who had had two children, was seen by Mr. Keele, of Highbury, in August, 1876. She complained of a severe pain in the left inguinal region; it had come on suddenly, and was greatly relieved by sedatives and hot applications. On examination the uterus was found somewhat enlarged, and a diagnosis of pregnancy was made. The abdomen grew rapidly until March, 1877, when Dr. Glover saw her in consultation with Mr. Keele. Pregnancy complicated by an ovarian tumour was diagnosed, and labour induced. A male child of six months was soon born, and the patient recovered well from the effects of the labour. Before delivery the abdomen measured fifty-two inches in circumference, after delivery forty-seven inches. The tumour grew rapidly, and on April 3d she was tapped, when thirty pints of thick grumous fluid were drawn off. She rapidly improved, and at the end of May was able to walk out. The cyst, however, began to fill again, sickness set in and became very distressing, the temperature rose, and on August 16th she was again tapped, when fifteen pints of thick grumous fluid were drawn off. Though relieved from the effects of pressure, she did not improve, for the sickness increased, the temperature continued high and once rose to 104°, she had much pain, was losing flesh, and exhaustion was increasing; so on September 13th she was taken into University College Hospital.

On admission, pulse was very feeble, 120 a minute, weak and irregular; respiration 50, shallow, with frequent sighing; temperature 102° F. Urine scanty, acid, depositing a large quantity of urates; contains no albumen or sugar. Abdomen large, pendulous; lower part of wall shining and œdematous.

On September 15th the tumour was removed under carbolic-acid spray. All instruments, ligatures, etc., used were placed in a solution (one in forty) of carbolic acid, and the hands of all helping in the operation were washed in a similar solution. An incision from four to five inches long was made in the linea alba, beginning about an inch below the umbilicus. When the peritoneal cavity was opened a considerable quantity of ascitic fluid escaped. The tumour was found adherent to the abdominal wall in front and on the left side. The adhesions formed many loculi, which contained fluid, and most of them were readily torn

through. The cyst was then tapped, but the contents were too thick and viscid to pass through the tube. An incision was made into it, the edges of which were kept outside the wound to prevent the contents entering the cavity of the abdomen. The solid parts of the tumour were then broken up by the hand, and the mass drawn out. One adhesion had to be ligatured. The tumour sprang from the left ovary. The pedicle was transfixed and tied in two halves by a strong hempen thread. The tumour was cut off, and the pedicle dropped into the pelvis. On introducing a sponge into the peritoneum it was found that it contained neither blood nor cyst-contents. The wound was closed by four deep carbolized silk sutures with intermediate superficial silver sutures; Lister's protective was then applied, with a large quantity of loose antiseptic gauze, and a pad of eight folds of gauze having a strip of waterproof between its outer layer. The abdomen having been bandaged, the patient was placed in bed.

She was permitted to take lithia-water, ice, barley-water, milk, and a little brandy-and-water in case of sickness. She vomited two or three times during the first three days. The morning following the operation the temperature was normal; pulse 85; respiration 28. The wound was dressed first on the fifth day after operation, and it was almost entirely healed. It was sweet, and no pus had formed. It was dressed again on the eighth day, when it was quite healed. The patient recovered without a bad symptom, and was discharged on the twentieth day after operation.

The tumour consisted of one large cyst containing a thick dirty-brown gelatinous fluid, and a mass, forming about two-fifths of the whole, composed of a number of cysts with thick semi-solid opalescent substance. The fluid removed, together with the ascitic fluid, amounted to two gallons.

A Case of Hydatid Tumour of the Pelvis, simulating Retro-Uterine Hæmatocele.

Dr. F. VILLARD relates (*Annales de Gynécologie*, Feb. 1878) a case of retro-uterine hydatid tumour, which ended fatally. The patient was thirty-two years old, and had had three children, the last three years ago. Menstruation had always been normal. On one occasion the menses did not appear till a fortnight after time, and were more scanty than usual. On the third day of menstruation, she was attacked with violent hypogastric pain and vomiting, and was obliged to take to her bed. The symptoms continued and increased during the next five weeks, at the end of which Dr. Villard first saw the patient. She was then much exhausted, pulse 120, face expressive of suffering, dorsal decubitus. There was frequent bilious vomiting, and a constant, though not considerable, discharge of dark blood continued. For two or three days there had been a general icteric tint of skin.

On examining the abdomen, a deep swelling was felt toward the right side, reaching nearly as high as the liver, and passing over the median line toward the left. Another swelling, the fundus uteri, was felt above the pubes. *Per vaginam*, a rounded, somewhat elastic swelling was felt, occupying the whole posterior cul-de-sac, and continuous with the abdominal tumour. The cervix was much displaced forwards and upwards, and the os was somewhat patulous, admitting the tip of the finger. The diagnosis made was that of retro-uterine hæmatocele.

On January 8 some improvement had taken place, but the hemorrhage continued, although not in great amount. On the 12th prostration had increased, the pulse was thready, and the icteric tint had increased. The next morning it was reported that the patient had been delivered of serpent's eggs, and it was found that she had passed about two litres of blood mingled with innumerable

hydatid vesicles. On vaginal examination, an aperture was found through the posterior cul-de-sac into the pelvic cavity, and the tumour had collapsed. The patient died a few hours after, but no autopsy was permitted.

The author collects for comparison twelve recorded cases of hydatid tumour of the pelvis. In two of these the seat of disease was the ovary, which had become fixed in the pelvis behind the uterus, in three the recto-vaginal septum, in the remaining seven the sub-peritoneal cellular tissue. The very grave nature of the disease in such a situation was shown by the fact that eight of the twelve cases ended fatally, seven of them without any operative interference. In one recovery took place without interference, in three after incision of the cyst. In no single case was the hydatid thrill observed, probably on account of the deep situation of the tumour, but it is also probable that frequently, as in the author's own case, it had not been sought for. In conclusion, the history of these cases shows that the symptoms and physical signs were simply those which might be produced by any tumour in the same situation, and that the only possible means of certain diagnosis is the evacuation, natural or artificial, of the contained fluid. The author recommends free incisions of the cyst, followed by antiseptic injections, remarking that, in his own case, a simple puncture would not have evacuated the numerous secondary cysts.—*Obstetrical Journal of Great Britain*, May, 1878.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Fatal Pistol-Shot without Perforation of the Skin.

Dr. HOFMANN (*Lehrbuch der Gerichtlich. Medicin*, 2 Band, Wien, 1878) relates the following remarkable case. A man, aged 40, fired a pistol-shot at himself in the region of the left breast. A skin-burn resulted of the size of the palm of the hand, but no rupture of continuity of the external skin. Beneath this, there was an effusion of blood; the costal cartilage was broken. In the pericardium lay a pound and a half of blood; and at the apex of the heart, on each side of the longitudinal sulcus, was a rent of the muscular fibres, extending into the cavities of the ventricles.—*British Med. Journal*, March 16, 1878.

Sulphuric Acid as an Antidote to Carbolic Acid.

Dr. SENFTLEBEN (*Deutsche Militairärztl Zeitschrift*, Heft 1, 1878), recommends sulphuric acid as a remedy for the toxic symptoms produced by carbolic acid. The poisoning is produced by the presence of phenol in the blood; and he says that the sulphuric acid, combining with this, produces sulphocarbolic acid, which is innocuous. He has treated several cases successfully on this principle. The mixture which he uses is: Dilute sulphuric acid, one part; gum water, two hundred parts; syrup, thirty parts; one tablespoonful to be taken every hour.—*London Med. Record*, May 15, 1878.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Acute Inversion of the Uterus. By SAMUEL HALL, M.D., of Reedsburgh, Sauk County, Wisconsin.

On July 25, 1877, I was called in great haste to see a German woman, æt. about 20 years, who had just been delivered of her first child. The midwife who was in attendance said that the patient had a very rapid delivery; that soon after something came away, she did not know what it was, but that she was flowing to death. I found the patient lying on her back, pale and anxious, lips colourless, pulse small, and very frequent, seemingly in "articulo mortis." Examination revealed a long tumour, somewhat rounded at the base, protruding through the vulva, between the thighs; lying beside it and almost detached, was the placenta; blood was fast oozing from the surface of the tumour, and slipping down in successive clots from it; the tumour was diagnosed as an inverted uterus; it was firmly contracted, and hard.

As there was no time for delay, I at once proceeded to detach the remaining portion of the placenta, and remove it, which was very easily done; then while my left hand firmly grasped and held the tumour from receding upward into the vagina (as it was very much inclined to do when pressure upward was made) with the thumb of my right, I made effort to indent the wall of the inverted fundus; after patient and continued pressure. I at last succeeded in making a slight impression. Becoming quite fatigued, and my thumb almost paralyzed, from the long continued effort, as applied by it, I found it necessary to suspend pressure, in order to bring the ends of my fingers (brought together in the shape of a cone) to bear on the indentation made.

I had expected when *pressure* was removed to make the change, that the dent would return, and my labour all be lost, but to my great satisfaction there was no such result.

The reversion of the organ was now more rapid, so that continuing the pressure with my right hand, I very soon released my grasp with the left, and permitted the organ to recede upward through the vulva, the vaginal walls were put on the stretch, and the whole uterine body passed readily through the mouth and cervical canal, which were now well dilated, and the uterus was restored to its normal position. My hand was passed over the entire internal surface to satisfy myself that all parts of the wall were completely returned, retaining it there until firm contraction came on, when it was slowly withdrawn.

Saw patient comfortably placed in bed, advised her to have rest and quiet. No untoward circumstance prevented a good and speedy getting-up.

DOMESTIC SUMMARY.

Laparo-Elytrotomy: a Substitute for the Cæsarean Section.

At a late meeting of the New York Academy of Medicine, Dr. T. GAILLARD THOMAS read a very important paper (*Am. Journal of Obstetrics*, April, 1878) descriptive of this operation and its results.

This operation consists in cutting through the abdominal walls by an incision above Poupart's ligament, extending from the spine of the pubes to the anterior superior spinous process of the ilium, avoiding the peritoneum by lifting it up with the fingers and then cutting through the vagina, which is pushed upwards into the iliac opening by a sound or the finger of an assistant, and delivering through the os uteri. This operation was conceived by Dr. Thomas, and he did not discover until some time afterward that it had been proposed in 1806 by Jörg, and modified and executed with fatal result in one case by Ritgen.¹

The operation of laparo-elytrotomy has now been performed twice by Dr. Thomas, and three times by Dr. Skene, with safety to the mothers in three of the cases, and with the delivery of living children in four. To this statement should be added the facts that in one case the mother was *in articulo mortis*, and the operation was performed in the interest of the child alone, who was born alive and uninjured; in another, it was undertaken solely for the relief of the mother, who was almost moribund, the child being already dead. In three of the cases the bladder was injured, so that a fistulous orifice resulted, which, in two of them, healed spontaneously.

Dr. Thomas considers whether laparo-elytrotomy avoids the dangers attending upon laparo-hysterotomy, and in what manner such avoidance is effected. The chief dangers of the latter procedure are: 1st. Peritonitis; 2d. Metritis; 3d. Hemorrhage; 4th. Shock; 5th. Incarceration of intestines in uterus; 6th. Septicæmia. The operation of laparo-elytrotomy avoids entirely the first, second, and fifth of these dangers, and in great degree diminishes the probability of the fourth and sixth. It may be followed by the third (hemorrhage), and in place of peritonitis may create cellulitis. As neither peritoneum nor uterus are cut, the great risks of inflammation of these parts, together with that of hernia into the uterus, are avoided. The peritoneal cavity being unopened, there is little danger of that sudden nervous prostration which we style shock; and as the wound admits of being flooded constantly with carbolic water, the probability of the occurrence of septicæmia is very much lessened.

The great danger to be apprehended is unquestionably hemorrhage. In none of the five cases reported did it occur, but the future may belie the past in this regard. There is a congerie of large, tortuous arteries around the vagina which must be severed; but by means of ligatures, the actual cautery, or such styptics as the persulphate of iron, hemorrhage could probably be controlled, even if it did occur.

Dr. Thomas concludes his very valuable paper by giving the following advice concerning the details of the consecutive steps of this operation:—

First. The operator should be provided with a pocket-case of instruments. ether, Barnes's dilators, and Paquelin's thermo-cautery, or, in place of it, ordinary cautery-irons.

Second. The patient having been etherized, she should be placed upon a firm table, and the os fully dilated by Barnes's dilators.

Third. The abdominal wound should be made; the peritoneum lifted; the

¹ Kilian, *Op. Geburtshülfe*, vol. ii. p. 715.

vagina opened; and the child delivered by version, if the head or arm present; by extraction, if the breech do so.

Fourth. The placenta having been delivered, and the uterus caused to contract firmly, the iliac fossa should be cleansed by a stream of warm water, introduced through the abdominal wound, and escaping through the vagina; and if hemorrhage exist, ligatures should be applied, if possible through the abdominal wound, to the bleeding vessels. Should this prove impossible, the vagina should be distended by a large metallic speculum, and the lips of the abdominal wound being widely separated, the bleeding points touched by the actual cautery carried down from above. Should this fail, the uterus should be made to contract firmly by ergot, and both vagina and iliac fossa be thoroughly tamponed with cotton soaked in water and squeezed, but free from any styptic. Then a broad band of adhesive plaster, and a compress should be applied over the lower portion of the abdomen.

Fifth. Should no undue hemorrhage occur, the abdominal wound should be closed by interrupted silver sutures; the vagina should be syringed out every five hours with warm carbolized water, the nozzle of the syringe being carried through the vaginal opening, and the fluid forced out through that in the abdomen. The patient should be kept perfectly quiet, nourished by milk and animal broths, and kept free from pain by opium.

Intra-Venous Injection of Milk as a Substitute for Transfusion of Blood.

Dr. T. GAILLARD THOMAS recently read a valuable paper before the New York Academy of Medicine (*Med. Record*, April 27, 1878) upon the above subject, in which reference was first made to the origin, the history, and the present status of the operation of transfusion of blood.

To the question, "What is the real status of this resource in medicine?" Dr. Thomas gave the following answer: "Transfusion of blood into the human system is an operation the plausibility and theoretical advantages of which all admit, but practically the results of the operation amount to but very little indeed."

The insecure position which the operation occupied practically, was due largely to its inherent difficulties and dangers, nearly all of which arose from the tendency of the blood to coagulate. To overcome those difficulties and dangers various methods of preparing the blood for intra-venous injection had been suggested, and other fluids had also been offered as a substitute. The object of the paper was to prove that in the milk of the cow we had a fluid which met all the theoretical and practical requirements of a safe intra-venous injection.

Dr. Thomas then related the cases in which he had resorted to intra-venous injections of milk as a substitute for transfusion of blood.

The first case was operated upon by Dr. Thomas for the removal of a large abdominal tumour in October, 1875. The case, in all its details, had already been published.¹ Because of the severe loss of blood subsequent to the operation, and the general condition of the patient, it was resolved to resort to intra-venous injections of some restorative fluid, and Dr. Thomas decided to employ for that purpose perfectly pure fresh milk. The suggestion of using intra-venous injections of milk was made by Dr. E. M. Hodder, of Toronto, Canada, who, twenty-eight years ago, employed it in the treatment of collapse in cases of Asiatic cholera. The suggestion was revived by Dr. J. W. Howe, of New York, who, about one year previous to Dr. Thomas's first operation, had injected 3vj of goat's milk into the cephalic vein of a patient suffering from phthisis.

Accordingly a healthy cow was driven into the yard, and 3viiss of milk, drawn

¹ Amer. Journ. of Med. Sci., Jan. 1876, p. 61.

from her udder into a porcelain dish surrounded with warm water, was permitted to flow slowly into the median basilic vein of the patient from a glass funnel to which was attached a rubber tube and a suitable nozzle to be introduced into the opening in the bloodvessel. A rigor followed the operation; the temperature rose to 104° F.; but those symptoms soon passed away. On the twenty-first day the lady was able to walk down stairs, and recovery was soon complete.

Soon after, Dr. J. W. Howe made some experiments upon dogs. Into the veins of *five* animals he injected milk, and all died promptly. Dr. Dupuy repeated Dr. Howe's experiments, and found that injections of milk which had been removed from the cow for a very short time uniformly proved fatal, while the injection of *perfectly fresh* milk was entirely innocuous. These experiments revealed the secret of failure in Dr. Howe's experiments. The milk which he had employed had been drawn from the cow an hour or two previous to the time it was used, and had been transferred to the city in a railroad car. It had probably undergone chemical changes before it was used in the experiment.

The *second* case reported by Dr. Thomas was operated upon for ovariectomy. Feb. 3, 1878. Extensive adhesions were encountered. Peritonitis and abscess followed, and the condition of the patient became so grave that, on the twentieth day after the operation it was determined to resort to intra-venous injections of milk. A cow was secured, and the milk, drawn into a pitcher covered with carbolized gauze, was, in less than one minute from the time it was taken, flowing slowly into the vein of the patient. On the first of March a second injection was made, and 3xv of milk, taken in the manner referred to, was allowed to flow slowly into the vein. The injections were repeated March 2d, 4th, and 5th, and twelve, six, and eight ounces of milk respectively used. The case terminated fatally. The result, however, could not be used as an argument against the operation, because, when the first injection was made, the patient was fairly moribund. At each subsequent operation it was the unanimous opinion of all who saw the patient that death was inevitable within a very brief space of time. It was thought that the patient's life was *prolonged* at least six days by the five intra-venous injections of milk. At the autopsy there was found localized gangrene of the intestines, which proved that the case must have inevitably terminated fatally.

The *third* case reported simply proved that milk injected into the circulation was innocuous.

There are twelve cases upon record in which intra-venous injections of milk had been employed in the human subject: three by Hodder, two by Howe, and seven by Thomas.

Dr. A. JACOBI remarked that there was one point upon which Dr. Thomas had not dwelt, and to which he would make allusion. Dr. Thomas had referred in general terms to the poisonous character of milk which was an hour or two old. Naturally, we would not expect that any chemical change existed in cow's milk immediately after its removal. But there were a certain number of cows in which the milk had an acid reaction even when in the udder. A large number of specimens of milk were neutral, and turned acid very quickly after removal. But whether neutral, or acid, or alkaline, depended to a great extent upon the food which the animal had taken.

It was necessary that cows should feed in pasture in order that the milk should be naturally alkaline. Milk to be introduced into the blood must be alkaline, for the blood did not at all tolerate the presence of acids. It was that fact probably that gave explanation to the ill effects produced in Dr. Howe's experiment, and the absence of ill effects in Dr. Dupuy's experiments. The question then suggested itself, would it not be well in every case, before the milk was used, to test it with litmus-paper, and if it be acid, to make it alkaline by the addition of car-

bonate of soda? Cow's milk, when introduced into the blood, should be a little more alkaline than it was naturally. Again, it would, perhaps, be well to warn operators against injecting too large quantity at a single operation.

Dr. THOMAS remarked that the point last referred to by Dr. Jacobi had been illustrated in the case in which five injections were given. From six to eight ounces was probably about a reasonable quantity; eight was probably the maximum, and five the minimum quantity to be used at a single operation.

The conclusions reached by Dr. Thomas are embraced in the following propositions:—

1. The injection of milk into the circulation in place of blood is a perfectly feasible, safe, and legitimate procedure, which enables us to avoid most of the difficulties and dangers of the latter operation.

2. In this procedure, none but milk removed from a healthy cow within a few minutes of the injection should be employed. Decomposed milk is poisonous, and should no more be used than decomposed blood.

3. A glass funnel, with a rubber tube attached to it, ending in a very small canula, is better, safer, and more attainable than a more elaborate apparatus, which is apt, in spite of all precautions, to admit air to the circulation.

4. The intra-venous injection of milk is infinitely easier than the transfusion of blood. Any one at all familiar with surgical operations may practise it without fear of great difficulty or of failure.

5. The injection of milk, like that of blood, is commonly followed by a chill, and rapid and marked rise of temperature; then all subsides, and great improvement shows itself in the patient's condition.

6. I would not limit lacteal injections to cases prostrated by hemorrhage, but would employ it in disorders which greatly depreciate the blood, as Asiatic cholera, pernicious anæmia, typhoid fever, etc., and as a substitute for diseased blood in certain affections which immediately call for the free use of the lancet, as puerperal convulsions, etc.

7. Not more than eight ounces of milk should be injected at one operation.

8. In conclusion, I would suggest that, if milk answers, not as good, but nearly as good, a purpose as blood under these circumstances, its use will create a new era in this most interesting department of medicine. That it will answer such a purpose, I am convinced from lengthy consideration and some experience of the matter; and I would be false to my own convictions if I did not predict for "Intra-venous Lacteal Injection" a brilliant and useful future.

A New Method of Denuding Tissues.

Dr. ALBERT H. SMITH, of Phila., at the recent meeting of the American Medical Association at Buffalo, reported some experiments lately made with the burr of the dental engine, rotated with great velocity by Bonwill's flexible shaft, by which he has successfully denuded tissues in the restorative operations upon the female pelvic organs. In the perineal operation and in Emmett's operations for lacerated cervix, he has had the most satisfactory results. He claims for the method, great economy of tissue in the removal of a thin film; perfect control of action in deeper cutting; the production of a surface as fresh as if cut by a knife, yet bleeding less in the superficial denudation because it is less deep than must necessarily be made with a knife cleanly; also of a surface, smooth and uniform in character, especially adapted for facilitating a close and accurate adjustment, as so urgently necessary in the plastic operations upon the cervix.

The effect may be had either from the steel burr, which Dr. Smith had made for the special purpose, or from coarse corundum wheels.

Partial Excision of Spleen.

Dr. A. A. FARIS reports (*Am. Practitioner*, May, 1878) the case of Davis B., aged 36, of strong frame, but somewhat debilitated by reason of malarial fevers and their sequelæ, having also a much enlarged spleen. Whilst engaged in a fray that occurred on the first of February, 1874, he was cut with a knife, the blade of which was four inches long and three-fourths of an inch broad. Dr. Faris saw him soon after the injury, and found him suffering with two penetrating wounds of the left breast—one entering the lung through the third intercostal space just above the nipple, and the other through the second space near the sternum; also two wounds of the left arm—one through the upper third of the upper arm, the other through the ulno-radial space in the middle of the lower arm. There was also an incised wound, commencing one inch above the ant. sup. spinous process of the left ilium, extending upward and backward three inches, through which protruded a portion of the spleen, with a piece three inches long and one inch wide (in the centre) cut from its lower border, and hanging by a slender pedicle. Hemorrhage had been arrested by forced flexion of the thigh, not until much blood had been lost, however.

Dr. Faris cut off the partially detached portion of the spleen, pressed the edges of the wound firmly together, and carefully pushed the spleen inward until the cut surface was level with the integument; then, with a large curved needle, sewed the spleen and walls of the abdomen together, compressing them tightly with quill sutures, afterwards approximating as near as he could the edges of the integument over the cut surface of the spleen with a small silk suture.

The wounds healed kindly, and the patient is now enjoying good health.

Subperiosteal Excision of the Entire Scapula and Head of the (right) Humerus; Recovery.

Dr. CHARLES B. BRIGHAM, of San Francisco, reports (*Boston Medical and Surgical Journal*, April 11, 1878) a case of this. The operation was performed on account of necrosis. The scapula was excised by a single incision along the spine. The bone came away entire. The patient can now (one month after the operation) put his right hand to his left shoulder unassisted; he can move his arm backwards and forwards an inch in each direction, and has full use of the right hand in writing, eating, and in all the ordinary movements.

Hare-lip and Cleft Palate in the Negro.

In reply to the inquiry whether hare-lip occurs in the negro, and if it occurs whether it is not rarer in him than in the white race, Dr. MIDDLETON MICHEL, Prof. of Physiology and Histology in the Med. College of the State of South Carolina, contributes (*Charleston Med. Journ. and Review*, July, 1876) an interesting paper, in which he has collected the notes of thirty-two cases of congenital hare-lip and cleft palate in the full-blooded negro, and he does not believe that the defect is rare among them. He also shows that hare-lip occurs in the lower animals, and that this malformation does not depend upon mal-nutrition, but is the result of an inexplicable deviation of cell-genesis.

Smallpox in the Pregnant Woman and in the Fœtus.

Dr. W. M. WELCH, Physician to the Philadelphia Smallpox Hospital, contributes to the *Medical Times* (May 25, 1878) an extremely interesting paper on this subject, based on a study of forty-six cases. He sums up his conclusions as follows:—

1. Smallpox in the female disturbs with striking frequency the functions of the womb, giving rise in the non-pregnant woman to premature appearance of the menses. and, in the pregnant woman, frequently exciting abortion.

2. Abortion is a very serious complication of smallpox. The earlier in the course of the disease it occurs, the more serious is the complication.

3. The fœtus does not generally undergo smallpox in utero, although occasionally such may be the case.

4. When a pregnant woman undergoes smallpox without miscarriage occurring, the susceptibility to the disease in the infant is not destroyed.

Spaying on account of Severe Dysmenorrhœa.

Dr. W. C. FREW, of Coshocton, Ohio, reports (*Ohio Medical Recorder*, May, 1878) the case of M. E., aged 24, single, who had suffered from violent dysmenorrhœa ever since menstruation had been established. The pain was intense, and during the first day morphia completely failed to relieve it. It confined her to bed, and lasted for five or six days. On the first day, her pulse and temperature would rise, the former frequently to 120; the latter to 102–103°, and her abdomen would become tympanitic and excessively tender. There was complete anorexia, and sometimes nausea and vomiting; this condition would last for a week or ten days, and then gradually disappear. These attacks were sometimes accompanied by complete suppression of urine; I have known her to go two or three days, and, on one occasion, four days without passing a drop of urine, and none could be found with the catheter. She was subject to all forms of hysterical manifestations—convulsions, paralysis, anæsthesia, hyperæsthesia, and mania. She had had, also, several attacks of chorea, each of which lasted for several months, and was greatly aggravated at the menstrual epochs; generally, after the period had passed, she would gradually improve in health until a fresh attack would prostrate her again. She was a chronic invalid, one-third of her time confined to her bed, one-third to her room, and almost the whole of the last third to the house.

There was no obstruction to the free escape of the catamenial fluid. No serious displacement, and no organic disease of the womb could be detected. There was severe vaginismus and tenderness in the pelvic region, even when she was enjoying her best health, so that for a thorough examination anæsthesia was necessary. Her condition seemed to progressively grow worse. When Dr. Frew suggested extirpation of the ovaries as a last resort, she immediately insisted upon the operation, although informed of its dangers. Life to her as it was, she said, was worse than worthless.

After consultation with Dr. Skene, of Brooklyn, and with the assistance of Drs. Johnson and Love, Dr. Frew, on 11th March, 1877, removed both ovaries through an abdominal incision. The pedicles were ligated, and the ligatures cut short and dropped into the abdomen. The only unlooked-for symptom during the first week was a sanguineous discharge from the vagina, which began two days after the operation and continued at intervals for three weeks, occasionally quite profuse, but most of the time very scanty. Her complete recovery was only interrupted by a slight attack of pelvic cellulitis in the second week.

Six months later the patient was very much improved in appearance. She menstruated on the 11th of September, just six months from the date of the operation, and again on October 4th. These hemorrhages were accompanied by pain, but not nearly so severe as formerly. The first was light and of short duration; the second was profuse.

Since that time, she writes me, she has menstruated profusely about once in

two months, and has suffered considerably with it. Her mother writes that she has had no hysteria or other nervous symptoms since the operation.

The ovaries were sent to Prof. J. C. Dalton, who pronounced them healthy.

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Tracheotomy in Diphtheritic Croup.

Concerning the value of tracheotomy in diphtheria additional information is still desired. Dr. R. G. BOGUE contributes (*Chicago Med. Journ.*, Feb. 1878) a report of fifteen cases in which he operated, and of which six were successful.

Dr. Bogue's experience in these cases has led him to the following conclusions:—

1st. That the so-called membranous croup and diphtheritic croup are the same disease, differing only in location, but requiring the same treatment.

2d. That tracheotomy should be resorted to in all cases where death is threatened by suffocation from obstruction in the larynx, and as soon as the breathing has become insufficient to sustain the vital powers, and should be resorted to during the so-called second stage of the disease.

3d. It is best, in the majority of cases, to use an anæsthetic.

4th. The trachea should be reached by careful dissection, and only opened after cessation of hemorrhage.

5th. A tube should be used.

6th. The temperature of the room should be not less than 75°, and free from currents of air. The air should be kept thoroughly saturated with steam. The vapour may be medicated. Dr. Bogue has used mostly a solution of glycerine (1-6), to which a little chlorate of potassa or carbolic acid may be added.

7th. The patient must be sustained by food. There may be, during the first night after the removal of the tube, some difficulty in breathing from spasm of the larynx, which will usually be relieved by an anodyne, such as a full dose of paregoric.

In none of the recovered cases has there been any impairment of the voice.

PRIZE OFFERED BY THE ALUMNI ASSOCIATION OF THE COLLEGE OF
PHYSICIANS AND SURGEONS IN THE CITY OF NEW YORK.

The Alumni Association of the College of Physicians and Surgeons in the City of New York offer for the following year a prize of FIVE HUNDRED DOLLARS, open for competition to all Alumni of this College. It will be awarded to the best medical essay submitted, if deemed sufficiently meritorious, upon any subject which the writer may select. The essay in order to compete must be based upon *Original Investigations*. Each essay must be marked with a device or motto and accompanied by a sealed envelope similarly marked containing the name and address of the author. Essays must be submitted to the Committee on or before February 15, 1879. They may be sent direct to any of the Committee, or to the College, care of the Faculty.

The Committee consists of Drs. HENRY B. SANDS, WM. H. DRAPER, and FRANK E. BECKWITH.

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TO READERS AND CORRESPONDENTS.

ALL communications intended for insertion in the Original Department of this Journal are only received for consideration with the distinct understanding that they are sent for publication to this Journal alone, and that abstracts of them shall only appear elsewhere subsequently, and with due credit. Gentlemen favouring us with their communications are considered to be bound in honour to a strict observance of this understanding.

Contributors who wish their articles to appear in the next number are requested to forward them before the 1st of November.

Compensation is allowed for original articles and reviews, except when illustrations or extra copies are desired. A *limited* number of extra copies (not exceeding *fifty*) will be furnished to authors, *provided the request for them be made at the time the communication is sent* to the Editors.

The following works have been received :—

Vorträge aus dem Gesamtgebiete der Augen-Heilkunde für Studierende und Aerzte. Von Dr. LUDWIG MAUTHNER, k. k. Universität-Professor in Wien. Erster Heft. Die Sympathischen Augenleiden, Weisbaden. J. F. BERGMANN. New York: B. Westmann & Co., 1878.

Die Osteoplastentheorie auf Normalen und Pathologischen Gebiet. Ueber die Veränderung des Markes der langen Röhrenknochen bei experimentell erregter Entzündung eines derselben. Ueber die Nekrose den Knochen. Von Dr. F. BUSCH, a. ö., Prof. der Chirurgie an der Universität zu Berlin.

Drei Fälle von Gesichtsneuralgie dem Nervenresection geheilt oder gebessert. Von Dr. CARL FIEBER, Docenten der Chirurgie an der Wiener Universität. Berlin, 1878.

Notes on the Diseases affecting European Residents in Japan. By STUART ELDRIDGE, M.D., one of the surgeons of the General Hospital of Yokohama. Shanghai, 1878.

Placentarreste nach Zeitgeburten. Von ALOIS GRAETTINGER, aus Milwaukee, Wis. München, 1878.

Varicocele. Von NIKOLAUS SENN. Aus Milwaukee, Wis. München, 1878.

On Asthma: its Pathology and Treatment. By J. B. BERKART, M.D., M.R.C.P. Lond. London: J. & A. Churchill, 1878.

Contributions to the Physiology and Pathology of the Breast and its Lymphatic Glands. By CHARLES CREIGHTON, M.B., Demonstrator of Anatomy in the University of Cambridge. London: Macmillan & Co., 1878.

Guy's Hospital Reports. Third series, vol. xxiii. London: J. & A. Churchill, 1878.

Aids to Chemistry. Specially designed for Students preparing for Examinations. Part II. Inorganic. The Metals. By C. E. ARMAND SEMPLE, B.A., M.D., Cantab. London: Baillière, Tindall & Cox, 1878.

Phosphates in Nutrition, and the Mineral Theory of Consumption and Allied Diseases. By M. F. ANDERSON. London: Baillière, Tindall & Cox, 1878.

The Numeration of Blood-Corpuscles, and the Effect of Iron and Phosphorus on the Blood. By W. R. GOWERS, M.D.

On Giant Urticaria. By J. L. MILTON. London, 1878.

Cholecystotomy for the Removal of Gall-Stones in Dropsy of the Gall-Bladder. By J. MARION SIMS, M.D. London, 1878.

A Review of the Past and Present Treatment of Disease of the Hip, Knee, and Ankle-Joints, with their Deformities. By HUGH OWEN THOMAS. Liverpool, 1878.

Fownes' Manual of Chemistry, Theoretical and Practical. Revised and corrected by HENRY WATTS, B.A., F.R.S. A new Am. ed. from the 12th Eng. ed. Edited by ROBERT BRIDGES, M.D. Philadelphia: Henry C. Lea, 1878.

Anatomy, Descriptive and Surgical. By HENRY GRAY, M.D., F.R.S. With an Introduction to General Anatomy and Development. By T. HOLMES, M.A., Cantab. A new Am. from eighth and enlarged Eng. ed. To which is added Landmarks, Medical and Surgical. By LUTHER HOLDEN, F.R.C.S. Philadelphia: Henry C. Lea, 1878.

A Clinical History of the Medical and Surgical Diseases of Women. By ROBERT BARNES, M.D. Lond., Obstetric Phys. and Lect. on Obstetrics and Dis. of Women to St. George's Hosp. Second Am. from the second and revised Lond. ed. Philadelphia: Henry C. Lea, 1878.

Elementary Quantitative Analysis. By ALEXANDER CLASSEN, Prof. in the Royal Polytechnic School, Aix-la-Chapelle. Translated with additions by EDGAR F. SMITH, A.M., Ph.D., Assist. in Analytical Chemistry in the Towne Scientific School, Univ. of Penna. Philadelphia: Henry C. Lea, 1878.

The Antagonism of Therapeutic Agents, and what it Teaches. By J. MILNER FOTHERGILL, M.D. Edin., Assist. Phys. to West London Hosp., etc. Philadelphia: Henry C. Lea, 1878.

On the Therapeutic Forces: An Effort to Consider the Action of Medicines in the Light of the Modern Doctrine of the Conservation of Force. By THOMAS J. MAYS, M.D. Philadelphia: Lindsay & Blakiston, 1878.

Atlas of Skin Diseases. By LOUIS A. DUHRING, M.D. Part IV. Philadelphia: J. B. Lippincott & Co., 1878.

Studies in Pathological Anatomy. By FRANCIS DELAFIELD, M.D. Nos. 6, 7. New York: Wm. Wood & Co., 1878.

A Practical Treatise on the Diseases of the Ear, including the Anatomy of the Organ. By D. B. ST. JOHN ROOSA, M.A., M.D., Prof. of Dis. of Eye and Ear in Univ. of City of New York, etc. New York: William Wood & Co., 1878.

A Practical Treatise on the Medical and Surgical Uses of Electricity. By GEORGE M. BEARD, A.M., M.D., and A. D. ROCKWELL, M.D. 2d ed., revised, enlarged, and mostly rewritten. New York: William Wood & Co., 1878.

Stricture of the Male Urethra; its Radical Cure. By FESSENDEN N. OTIS, M.D., Prof. of Genito-Urinary Dis. in Coll. of Phys. and Surgeons, N. Y. New York: G. P. Putnam's Sons, 1878.

Transactions of the American Gynecological Society. Vol. 2. For the year 1877. Boston: Houghton, Osgood & Co., 1878.

Litholapaxy, or Rapid Lithotripsy with Evacuation. By HENRY J. BIGELOW, M.D. Boston: A. Williams & Co., 1878.

Antagonism of Alcohol and Diphtheria. By E. N. CHAPMAN, A.M., M.D. Brooklyn, 1878.

The Value of Electrolysis in the Treatment of Ovarian Tumours. By PAUL F. MUNDÉ, M.D. New York.

Vascular Tumours of the Female Urethra. By A. REEVES JACKSON, M.D. Chicago.

On the Necessity of Caution in the Use of Chloroform during Labour. By WILLIAM T. LUSK, M.D. New York.

Certain Symptoms of Nervous Exhaustion. By GEORGE M. BEARD, M.D.

Treatment of Diphtheria. By P. F. WHITEHEAD, M.D. Vicksburg, Miss.

Carbolic Acid Injections in the Treatment of Piles. By A. B. COOK, M.D. Louisville.

The Present Status of the Pathology of Consumption and Tuberculosis. By J. HILDYARD TYNDALL, M.D., of New York City. New York, 1878.

Relative Frequency of Colour-Blindness in Males and Females. By JOY JEFFRIES, A.M., M.D. Cambridge, 1878.

The Identification of the Human Skeleton. By THOMAS DWIGHT, M.D., of Boston. Boston, 1878.

On Lying-in Institutions, especially those in New York. By HENRY J. GARRIGUES, M.D.

Congenital Absence and Accidental Atresia of the Vagina. By T. A. EMMET, M.D. The Hystero-Neuroses with Especial Reference to the Menstrual Hystero-Neurosis of the Stomach. By GEORGE J. ENGELMANN, M.D.

The Functions of the Anal Sphincters, so-called. By JAMES R. CHADWICK, M.D. Amputations and Excisions of the Cervix Uteri; their Indications and Methods. By J. BYRNE, M.D.

Variola; its Causes, Nature, and Prophylaxis, and the Dangers of Vaccination. By C. SPINZIG, M.D. St. Louis, 1878.

Report of 2000 Cases of Disease in Children treated at the Dewitt Dispensary, New York, with Notes. By P. BRYNBERG PORTER, M.D. New York, 1878.

Defective Medical Education the Chief Obstacle to a Proper Appreciation of our Profession by the Public, and what our Alma Mater is doing to Remove it. By W. A. B. NORCOM, M.D. Philadelphia, 1878.

On the Nature, Origin, History, and Public Prophylaxis of Venereal Diseases, and the Doctrines of Syphilis. By THOS. KENNARD, M.D. St. Louis, 1878.

Neuralgia and its Modern Therapeutics. By JAMES BAIRD, M.D. Atlanta.

The Pith of the Dried Corn Stalk as a Uterine Tent. By W. T. GOLDSMITH, M.D. Atlanta.

Report on Public Hygiene and State Medicine. By F. W. HATCH, M.D. Sacramento. The Application of Pressure in Diseases of the Uterus. By V. H. TALIAFERRO, M.D. Atlanta.

The Causation of Typhoid Fever. By GEORGE E. WARING, Jr. Cambridge, 1878.

Hystero-Neurosis, with Cases. By G. A. MOSES, M.D. St. Louis, 1878.

Urethral Stricture. By THOMAS R. BROWN, M.D. Baltimore, 1878.

Floating Spleen. By FREDERICK C. SHATTUCK, M.D., of Boston.

- Eight Cases of Intra-Laryngeal Growths removed through the Natural Passages. By J. H. HARTMAN, M.D. Baltimore.
- Certain Symptoms of Nervous Exhaustion. By GEORGE M. BEARD, M.D.
- Sound and the Telephone. By CLARENCE J. BLAKE, M.D. Boston.
- On the Postural Treatment of Tympanitis Intestinalis following Ovariectomy. By EDWARD W. JENKS, M.D. New York, 1878.
- Bibliotheca Medica. Cincinnati: Robert Clarke & Co., 1878.
- Rectification of Abnormal Fœtal Positions. By THOMAS RYERSON, A.M., M.D. Newton, N. J.
- Address before the American Medical Association. By T. G. RICHARDSON, M.D., of New Orleans. Philadelphia, 1878.
- Psoriasis non Syphilitica. By S. H. STOUT, M.D. Roswell, Ga.
- The New Treatment for Chorea. By JOHN VAN BIBBER, M.D. Baltimore, 1878.
- Double Optic Neuritis and Sloughing of the Right Cornea accompanying a Sarcomatous Tumour of the Right Side of the Brain. A Case of Choroiditis Exudativa. By SWAN M. BURNETT, M.D. Washington, D. C. New York, 1878.
- Report on Public Hygiene in Indiana. By THAD. M. STEVENS, M.D. Indianapolis.
- A Hystero-Psychosis. The Obstetric Forceps. By GEO. J. ENGELMANN, M.D. Saint Louis, 1878.
- The Soft Palate. By WM. ABRAM LOVE, M.D. Atlanta, 1878.
- Medico-Legal Evidence relating to the Detection of Human Blood presenting the Alterations of Malarial Fever. By JOSEPH JONES, M.D. New Orleans, 1878.
- Post Nasal Catarrh, Tubercular Laryngitis. By WM. PORTER, M.D., of St. Louis.
- Modern Stimulation, etc. By T. J. W. PRAY, M.D. Concord, 1878.
- On Feticide. By HENRY GIBBONS, Sr., M.D.
- Reflex Symptoms in Hip Disease. By EDWARD H. BRADFORD, M.D., of Boston.
- Address before the Indiana State Medical Society. By L. D. WATERMAN, M.D. Indianapolis, 1878.
- A Case of Urinary Suppression in Yellow Fever; treated by Super-oxygenated Air and Jaborandi. By W. HUTSON, of St. Louis.
- The Brain and Nervous System in their Relations to Teaching and Learning. By J. C. REEVE, M.D. Dayton, 1878.
- Strictures of the Cervical Canal. By A. FREDRIK EKLUND, M.D. Upsal, Stockholm. Translated by A. SIBLEY CAMPBELL, M.D. Atlanta, 1878.
- Upon the Treatment of Strumous Disease by what may be called the Solfatara Method. By HORATIO R. STORER, M.D., Newport, R. I. Boston, 1878.
- Batley's Operation; Three Fatal Cases with some Remarks upon the Indications for the Operation. By GEORGE J. ENGELMANN, M.D. New York, 1878.
- A Conspectus of the Different Forms of Phthisis, intended as an Aid to Differential Diagnosis. By ROSWELL PARK, M.D. Chicago, 1878.
- Further Testimony on the Use of Large Probes in the Treatment of Strictures of the Nasal Duct. By SAMUEL THEOBALD, M.D. New York, 1878.
- A Paper on Intra-Laryngeal Growths. By CLINTON WAGNER, M.D. Columbus, 1878.
- The Prevention of Disease, Insanity, Crime, and Pauperism. By NATHAN ALLEN, M.D. Boston, 1878.
- Transactions of the Iowa State Medical Society. 1877-78. Des Moines, 1878.
- Transactions of the Rhode Island Medical Society. 1877-78. Central Falls, 1878.
- Transactions of the Mississippi State Medical Association. 1878. Jackson, 1878.
- Transactions of the Medical Association of Georgia. 1878. Atlanta, 1878.
- Proceedings of the Connecticut Medical Society. 1878. Hartford, 1878.
- Transactions of the South Carolina Medical Association. 1878. Charleston, 1878.
- Transactions of Medical and Chirurgical Faculty of Maryland. 1878. Baltimore, 1878.
- Transactions of the Medical Society of the State of California. 1877 and 1878. Sacramento, 1878.
- Proceedings of the Medical Society of the County of Kings. July, Aug., Sept. 1878.
- Proceedings of the Academy of Natural Sciences. Jan. to April, 1878.
- Medical Communications of Massachusetts Medical Society. Vol. xii. No. IV. 1878.
- Transactions of the Medical Society of the State of New York. 1878. Syracuse, 1878.
- Transactions of Medical Association of State of Missouri. 1878. St. Louis, 1878.
- Transactions of Medical Association of Alabama. 1878. Montgomery, 1878.
- Transactions of Medical Society of State of North Carolina, 1878. Wilmington, 1878.
- The American Medical College Association. Annual Meeting. 1878. Detroit, 1878.
- Annual Reports of the Supervising Surgeon-General of the Marine-Hospital Service of the United States for the Fiscal Years 1876 and 1877. Washington, 1878.
- Report of the Board of Health of the City of Boston. 1878. Boston, 1878.
- Report of the State Board of Health of the State of Michigan. 1877. Lansing, 1878.

The following Journals have been received in exchange:—

- Deutsches Archiv für Klinische Medicin. Bd. XXI., Heft 5 to 6. Bd. XXII., Heft 1, 2.
- Archiv der Heilkunde. Bd. XIX., Heft 4.

- Centralblatt für die Medicinischen Wissenschaften. Nos. 23 to 36, 1878.
 Allgemeine Wiener Medizinische Zeitung. Nos. 23 to 36, 1878.
 Deutsche Medicinische Wochenschrift. Nos. 23 to 35, 1878.
 Medizinische Jahrbücher. 1878. Heft 1.
 Medicinisch-Chirurgisches Centralblatt. Nos. 27 to 34, 1878.
 Upsala Läkarsällskapets Förhandlingar. Bd. XIII., Nos. 5, 6, 7, 8.
 Bibliothek für Læger. Bd. VIII., Heft 3.
 Nordiskt Medicinskt Archiv. Bd. X., No. 8.
 Annali Universali di Medicina e Chirurgia. Giugno, Luglio, Agosto, 1878.
 Giornale Italiano delle Malattie Veneree e della Pelle. Giugno, Agosto, 1878.
 Commentario Clinico di Pisa. Maggio, Guigno, Luglio, 1878.
 L'Imparziale. Nos. 11 to 16, 1878.
 Lo Sperimentale. Fascic. 6, 7, 8, 1878.
 La Medicina Contemporanea Nuova Rivista Italiana e Straniera. Giugno, Luglio, Agosto, 1878.
 O Correio Medico de Lisboa. Nos. 15, 16, 1878.
 Cronica Medico-Quirurgica de la Habana. Junio, Julio, Agosto, 1878.
 La Gaceta Cientifica de Venezuela. Nos. 20 to 30, 1878.
 Archives Générales de Médecine. Juillet, Aout, Septembre, 1878.
 Revue des Sciences Médicales en France et de l'Etranger. Juillet, 1878.
 Revue Mensuelle de Médecine et de Chirurgie. Juin, Juillet, Août, 1878.
 Annales de Dermatologie et de Syphiligraphie. Tome IX., No. 4.
 Annales des Maladies de l'Oreille et du Larynx. Juillet, 1878.
 Gazette Hebdomadaire de Médecine et de Chirurgie. Nos. 24 to 36, 1878.
 L'Union Médicale. Nos. 67 to 105, 1878.
 Le Progrès Médical. Nos. 23 to 36, 1878.
 Le Mouvement Médical. Nos. 21 to 27, 1878.
 L'Année Médicale. Nos. 7, 8, 9, 1878.
 Revue Scientifique de la France et de l'Etranger. Nos. 50, 51, 52, 1878.
 Union Médicale et Scientifique du Nord-Est. Juin, Juillet, Août, 1878.
 Revue Internationale des Sciences. Nos. 23 to 36, 1878.
 The Retrospect of Medicine. Jan. to July, 1878.
 The Lancet. July, Aug., Sept. 1878.
 The Medical Times and Gazette. July, Aug., Sept. 1878.
 The British Medical Journal. July, Aug., Sept. 1878.
 The Medical Examiner. July, Aug., Sept. 1878.
 The London Medical Record. June, July, August, 1878.
 The Sanitary Record. July, Aug., Sept. 1878.
 The Practitioner. June, July, August, Sept. 1878.
 Brain, July, 1878.
 The Obstetrical Journal of Great Britain. July, Aug., Sept. 1878.
 Edinburgh Medical Journal. June, July, Aug., Sept. 1878.
 The Glasgow Medical Journal. July, Aug., Sept. 1878.
 The Dublin Journal of Medical Science. June, Sept. 1878.
 The Doctor. Aug., Sept. 1878.
 The Australian Medical Journal. Oct., Nov. 1878.
 The Australian Practitioner. April, 1878.
 The usual American exchanges have been received; their individual acknowledgment is omitted for want of space.

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OF

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ARTICLE I.

LAPAROTOMY IN A CASE OF EXTRA-UTERINE FETATION; OPERATION FOR REMOVAL OF DEAD BODY OF CHILD; RECOVERY OF THE WOMAN. By WALTER F. ATLEE, M.D., of Philadelphia. WITH SUPPLEMENTARY REMARKS UPON THE IMPORTANCE OF OPERATING EARLY; AND DANGERS OF THE OLD SYSTEM OF WAITING FOR NATURE. By ROBERT P. HARRIS, M.D., of Philadelphia.

I was consulted on September 5, 1877, by Mrs. M. O., of Germantown, on account of the irritable condition of her stomach. She was a native of Ireland, came to this country when she was nine years of age, was then thirty-five, and had been married sixteen years. She had always been perfectly regular in her menstrual discharge until the previous April, since when she said she had been irregular. On the 24th of May there was considerable hemorrhage, and after that she had seen nothing. After examination I told her I thought her to be pregnant. I advised the use of effervescing salt of pepsin, bismuth, and strychnia for sickness of stomach.

On the 13th of April following, she came to my office. From her condition and history I then believed her to be carrying in the abdominal cavity, outside of the womb, a child that had come to full term in January, when the child had died. The body was in the lower part of the belly, placed transversely, the back forwards, and the head on the left side. I advised her to wait until symptoms of blood-poisoning should come, when this body should be removed; otherwise that nature was not to be interfered with at all, until a channel was indicated through which she was endeavouring to get rid of this body, and then the patient was to be helped. An operation then would shorten the duration and the suffering of the eliminative process; it was one of but little danger, and a source of great advantage.

The patient came to see me one month afterwards, and in the mean while I had become convinced that this advice was not good, but that the body should be removed without delay. When this was told her, and an

immediate operation proposed, she eagerly gave her consent. Her pulse was then 109°, but there were no decided symptoms of purulent infection.

On the 16th of May the patient came to this city to the room prepared for her in the St. Joseph Hospital; after this no food was allowed to be taken except barley water; on the 17th in the evening a dose of oil was administered; on the morning of the 18th 10 drops of McMunn's elixir of opium were given; an injection thoroughly emptied the lower bowel, and at 11 o'clock, after taking a drink of two ounces of whiskey, the patient was placed on the operating table and chloroformed. An incision six inches in length, beginning one inch above the navel, was made in the *linea alba*; the peritoneum was found thickened and vascular, but not with large bloodvessels; it reminded me of inflamed dura mater, though not quite so thick. This opened, a liquid like pea soup, about one and a half pints in quantity, came out, and the child's body showed itself, and was pulled out with little trouble breech foremost. The cavity in which it was contained was cleaned out by sponging; at the bottom a knuckle of intestine showed itself, about two inches in length, and less than one inch in breadth. With this exception the dead body of the child, which weighed four pounds and two ounces, appeared to have been cut off from the rest of the contents of the abdomen by a continuous membrane of greater or less thickness. No further investigation was made of the state of things. The umbilical cord was cut so that about four inches hung out of the lower part of the wound; alongside of it a drainage tube of India rubber was placed, the wound was sewed up, and the usual dressings applied. After removal to bed a quarter grain of morphia in Magendie's solution was injected under the skin of the arm.

After the operation, with the exception of the injection just mentioned, opium was given only three times, and then by enema in the form of McMunn's elixir, together with bromide of potassium, for the purpose of producing sleep, on the 19th, the 21st, and the 25th. She was allowed to pass her urine as she wished, in the bed-pan; after the 31st, she was allowed to get out of bed for this purpose. On the 24th she had her bowels moved for the first time; using the bed-pan. For the second time on the 31st. For the first four days, on account of sickness of stomach, which lasted two days, and hiccough that lasted four, she was nourished by injections of beef-essence—two ounces being given every four hours. After that time she used, in the usual way, mutton soup and milk; on the 24th ate some bread, on the 26th beefsteak, and by degrees was allowed her ordinary food.

The pulse after the operation was generally about 105; the temperature was never noticed above the normal standard. The drainage-tube was removed two days after the operation. The discharge for some two days had particles of caseous matter in it, afterwards it became a healthy creamy pus. The cord dropped on the 24th. On the 28th while seated in bed, about a teacupful of healthy pus suddenly came from the vagina. By the touch I could find no orifice whence this came. This vaginal discharge, though very small in quantity, continued for five days. On the 3d of June and for five days afterwards, shreds of stuff resembling a breaking down membrane were discharged, and as they did so, a body about the size of a small fist, in the left iliac fossa, gradually disappeared.

On the 13th the patient went to her home in Germantown in very good health, a few drops of pus still coming from the wound, but the discharge diminishing daily.

W. F. A.

Of the three varieties of puerpero-abdominal surgery, viz., the Cæsarean section, the abdominal section after uterine rupture, and the same in extra-uterine pregnancy, the third has been the most rarely performed, and has only quite recently begun to attract attention; especially as an operation to be resorted to early, and as an elective procedure. There is some confusion in the classification of cases and operations; but I do not propose to alter it here. The abdominal pregnancy is called *primary*, when developed originally in the cavity of the abdomen; and *secondary*, when the ovum or fœtus has escaped from the original cyst and become subsequently developed as a ventral fœtation. The operation is also *primary*, if performed during the life of the fœtus, and *secondary*, if after its death, no matter whether recent or remote. We have, therefore, a case and operation both termed *secondary*; but the latter, *early* and *elective*.

In view of the happy termination of the operation, it is a satisfaction to me to reflect upon the fact that I recommended its performance both to surgeon and patient, and advised as early a resort to the knife as practicable, confirming my opinion by reference to several of the cases which are referred to in this paper. The patient readily assented, although she had been advised against an early operation, and knew that she ran much risk of her life; but she also knew that it was unsafe to remain as she was. As her days were unhappy and nights often miserable, by reason of suspense and suffering, she was anxious to be operated upon.

Progressive surgery has, within a few years, overcome in a measure many of the deep-seated prejudices of the profession against the several forms of operative interference, considered for a long period to be of themselves almost necessarily fatal; and in no one form is this more apparent than in that which involves the once much-dreaded incision into the abdominal cavity. The progress made in ovariectomy, and its unforeseen success in saving life, has led, and is gradually leading to greater boldness with confidence, in other abdominal operations. What would have been considered recklessness a few years ago, is coming, by reason of accumulated successes, to be regarded not only as legitimate but advisable; and the chief obstacle at the present time appears to lie, not so much in the danger of peritonitis, or septic infection, as in the difficulties of making an unquestionable diagnosis. Could tubal pregnancy be *positively* recognized at the time of rupture in the early months, we believe it would not be long before some bold operator would venture, and possibly with success, to open the abdomen of a woman, secure the bleeding vessels, or clamp the entire cyst, and evacuate the lost blood. This has never been done, and has but recently been condemned at a discussion on the part of high authorities in London; but it may yet be accomplished if the diagnosis can be satisfactorily determined and in time for the operation. Women have lived a number of hours, and, in some instances, several days after the bursting of a tubal cyst, when of so small a size that the operation

might have succeeded. I once reported the case of a lady who died in twenty-one hours after the cyst burst, in whom the operation might have been easily performed. The symptoms, clearly to my mind, although they did not to others present, indicated rupture, which I located in the right Fallopian tube, and proved by autopsy to be correct; but this diagnosis was only inferential, and therefore not sufficiently reliable to warrant an operation, even if it had been thought of, which it was not, as the case occurred in 1857. What was then in a measure conjectural, although based upon well-known evidences, may, under improved methods of diagnosis, in time become reliable. So many mistakes have been made by men of great fame, in their hurry of business, that it becomes necessary in avoiding their errors, to secure a clear clinical history of any given case, and then examine it with all the most approved and reliable methods known to science. What is known as hypogastric or pelvic colic, accompanied by vomiting, and possibly fainting, with symptoms of collapse, followed by recovery, should make an attending physician suspect a tubal pregnancy, and put him upon his guard for a more severe attack ending in rupture, or prepare him for dealing with a misplaced pregnancy at an advanced period, and keep him from falling into the error of believing that he has in hand an ovarian, or possibly a malignant tumour. Palpation and the sound are very important in determining the nature of abdominal tumours suspected of having a pelvic origin; but they have led wise men into error, when the patient's history had not been properly taken or regarded. It may be well to ignore the statements of a stupid woman as to her own case; but there are patients whose accounts of their past symptoms are remarkably clear, connected, and valuable, as in the clinical history, now to be given, of Dr. Walter F. Atlee's case.

Mrs. O., married at 20, and although regular, did not conceive for fifteen years, when her menses ceased, and she presumed herself pregnant, their last appearance dating April 15th, 1877. At the end of the sixth week she was attacked with a profuse hemorrhage, lasting seven days, and thought she had miscarried, as she passed a membranous substance which she said "looked like a piece of skin," such as she had never discharged on any former occasion, which was no doubt the *decidua*.

Soon the usual signs of pregnancy made their appearance, and her mammae commenced to develop and become painful. Pains in the abdomen were now experienced, and one morning, in the act of rising from bed, she had a very severe attack of pain, followed by vomiting, and remained sick for four or five days, but without medical advice. This pain was low down in the left side within the hip-bone, and evidently in the pelvis.

On June 30th, 1877, when presumed to be ten weeks pregnant, she was seized with vomiting, followed immediately by a very severe pain in the same locality as before, accompanied by a sensation of tearing, as if something had given way, and followed by another feeling, indicating that a body had fallen and was in some way pressing upon the bladder, creating a desire to urinate, and, at the same time, interfering with the ready pas-

sage of the fluid. This attack, which was no doubt one of rupture of an extra-uterine foetal cyst, and, in all probability, in some part of the left Fallopian tube, in which such early accidents are most apt to occur, was followed by symptoms of collapse, ending in violent peritonitis, the abdomen being much distended, painful to touch, and sensitive throughout, while the uterus was too tender to admit of the vaginal touch. After being considered in much danger for several days, she began to improve, and, at the end of a week, was well enough to be removed upon her bed to a farm at a short distance from her residence, where she soon in a measure recovered.

Here, in two weeks more, she had a third attack of pain but differently located, associated with vomiting and fainting turns, which continued for three days, during which she was treated with hypodermic injections of morphia and food enemata. After this, she had sick turns, difficulty in urination, and flying pains, lasting through the summer and down to September 5th, when she first felt the movement of the foetus. She was also affected with lameness in the left hip-joint, which had a sore feeling, as if inflamed.

When quickening took place, she was about $4\frac{1}{2}$ months advanced in her pregnancy; but the sensation was entirely abnormal in location, as she found by consulting some of her friends who had borne children naturally. The motion of the foetus was felt low down in the left side of the pelvis near the rectum, and sometimes further forward, near the bladder; or, as she expressed it, "the baby seemed to be right in the seat, sometimes back, near the backbone, and sometimes in front."

As gestation advanced, the movements of the foetus became more and more decided, and the location higher and higher, until, when she turned in bed, she could distinguish the sensation of a body moving from side to side within her abdomen. At last the foetal motions became so vigorous as sometimes to wake her out of sleep; her breasts enlarged until milk was secreted in them; her abdomen became very large and pendulous, so as to strike upon her thighs in walking, and her lower extremities oedematous, pitting decidedly on pressure. The child at this time rested partly on the thighs when she stood erect, and she could frequently feel the foetal movements impressed on their anterior face, both in walking and sitting, but particularly the latter. Gradually, her urinary difficulty decreased as pregnancy advanced, the secretion becoming more abundant, and at last passing readily.

Motion ceased in the foetus on January 10th, 1878, when it must have been within a week or two of its full maturity. Mrs. O. now began to diminish in size and improve in health, getting a better appetite and a good digestion. Her menses made their appearance about the first of February, and were preceded by intermittent pains like those of true labour, deceiving her medical attendant into a belief that she would shortly be delivered. The flow continued six weeks, and was at times very abundant, since which she has been regular, the last period closing on May 15th, three days before the operation.

This is certainly a remarkably connected record, especially shown in its symptomatic succession; and had we not made the examination of the patient personally, we might have supposed that she had in some degree been prompted to frame her statement of sensations; but such was not the case. A remarkably good memory, closeness of observation, and a

delicate sense of localization in pain and sensations, with good common sense, have enabled her to relate and explain her own feelings intelligibly.

Condition before the Operation.—Mrs. O. is of medium height, rather stout, weighing ordinarily 136 pounds, has a good colour, a healthy look, and a clean tongue, but, at the same time, an anxious expression of countenance, and a pulse of 105. She has at times sudden attacks of vomiting, almost without warning, and says that her condition is a constant source of disquietude, night and day. Her abdomen is full and still somewhat pendulous, but much less than formerly, and measures, when erect, 35 inches in circumference. Percussion and palpation show that but little of the fluid which once so largely distended the abdomen remains, the excess having been removed by absorption.

The fœtus can be readily distinguished, lying on its right side, with its occiput presenting to the left groin, its spine to the pubes, and nates to the right of the linea alba; in fact, it rests outside of the pelvis, across the abdomen, and is sustained by the abdominal parietes.

When upon her back, the abdomen has a high narrow convexity, depressed at the umbilicus, the centre of the protuberance being composed of an adipose cake, about an inch and a half thick and ten inches across, under the lower segment of which lies concealed the dead fœtus. There is no pain or sensitiveness in the abdomen, and the patient, when erect, can readily lift the fœtus, by placing her left hand under its head, and right, beneath the breech.

We should have been glad to know positively that this fœtus was encysted, and still more, that the cyst had adhered to the abdominal walls; but we are not aware of any method by which either can be safely and conclusively determined. The history of the case indicated that we should in all probability find a partial or complete sac, the product, in a measure, of inflammatory action, and the development of the fœtus made it probable that this cyst was not adherent in front. But this was only conjectural, although it proved to be correct. I know that Dr. Theodore Keller, of Strasbourg, in his thesis, *Des Grossesses Extra-uterines*, published in 1872, recommends that delay should, if possible, be made until adhesions shall have been formed between the cyst and the abdominal walls; but he fails to show how we are to know that there is either a cyst or adhesions.

The fact is, that each case must stand upon its own peculiarities, and the prognosis be made accordingly. The diagnosis being established, much will depend upon the health of the woman, and the variety of extra-uterine pregnancy to be operated upon. In the case before us we had reasons for feeling hopeful from the first, and it will be seen by the result that the prognosis was well founded.

It might be thought questionable whether a rupture of a Fallopian fœtal cyst could take place without death from hemorrhage as early as the tenth week, but for the autopsy made in a similar case by Prof. K. von Braun, of Vienna, in December, 1871.

The woman in question had no severe attack of pain at any time. She had a slight pain in the third month, followed by emaciation and failing health, but was always able to keep about, although much in hospitals as a patient. When Dr.

Braun saw her in November, 1871, her pregnancy had nearly reached maturity, and he proposed removing the fœtus; but pain and fever set in, and she died after a sickness of three days. In five minutes after her death, laparotomy was performed, and a living fœtus, weighing eight pounds, removed, which died in ten minutes. An autopsy showed distinctly that the pregnancy had been originally tubal, for in the right Fallopian conduit was the cyst, still containing the placenta, attached to the severed cord, and bearing evidence of the fact that rupture had taken place through a thin portion of the cyst-wall, where it would be attended with but little hemorrhage. There was no secondary cyst formed, the place of it being partly supplied by pseudomembranous deposits around the position of the fœtus. There had never been any marked evidence of either rupture or acute peritonitis, as in the case of Mrs. O. The right ovary in Dr. Braun's case was about one-half the size of the left, probably from its blood-supply being diverted to the cyst and placenta.¹

The first suspicious circumstance in Mrs. O.'s pregnancy was the fact that she had remained unfruitful so long after marriage, a condition not uncommon in women having a primiparous extra-uterine conception. Although primiparæ have in some instances died of Fallopian pregnancy within a few months after marriage, such immediate conceptions are rare, as it is also in multiparæ, to have a misplaced pregnancy, without a longer than usual interval having elapsed since the immediately preceding birth. This is accounted for by the fact that an abnormal arrangement of the tube in the primipara, and an inflammatory derangement of it in the multipara, are often discovered in women who have been the subjects of extra-uterine pregnancies, and are believed to have acted as the producing cause.

The origin of pelvic or tubal colic has never been unquestionably determined, although it has been thought to arise from the giving way of some of the fibres of the distending cyst, especially as it generally follows some muscular motion by which abdominal pressure is increased.² It is an important feature in the clinical history of a case, especially when connected with signs of pregnancy, and particularly where the feeling of fœtal motion is claimed. The clinical history of a case should always be taken from the patient before any physical exploration has been made, or we may be led into error, when it would otherwise have been almost impossible. We are not to stimulate a fertile imagination, or guide the patient into making erroneous statements by leading questions; but to let her tell her own story, keeping her to the order in which events have occurred. In one instance in this city, a prominent surgeon was misled into believing that a patient had a malignant tumour, until an abscess opened, through the orifice of which he felt bone in probing, and thus discovered his mistake. He then found, by questioning the woman, that she had had a train of

¹ London Med. Times, Sept. 1874, p. 347, from Wiener Med. Woch., Aug. 8, 1874.

² In a report of a case read before the King's County Medical Society, N. Y., by Dr. C. H. Giberson, on May 21, 1878, he attributes the paroxysms to hemorrhage beneath the outer investing layer of the cyst, and claims to have established the fact by the post-mortem appearances.—*Proceedings Med. Soc. County of Kings*, June, 1878, p. 129.

symptoms clearly indicative of extra-uterine pregnancy. Laparotomy confirmed her statement, and restored her to health.

The most critical period in the life of a woman who has escaped death by rupture of an extra-uterine cyst until the fœtus has neared maturity, is that of maturity itself; when a species of false labour sets in, often ending fatally in a variety of ways. If this period has been passed in safety, the woman may escape death a number of years, but her life and health are never secure while the fœtus remains in the abdomen, and for this reason there is a growing disposition on the part of accoucheurs to advise their early removal; a procedure that recent experience teaches us is less hazardous than delay. The very large proportion of women saved by laparotomy, after the formation and bursting of an abscess, generally near the umbilicus, has been used as a very specious argument in favour of delay; but we are learning wisdom by experience, and find that too many fall victims to their condition before an abscess forms, or points; or it points into the rectum, colon, bladder, or some inaccessible place, and results fatally.

Had Mrs. O. presented herself in the first week of January, it would have been possible to have saved her child by the *primary* operation, so strongly advocated by Keller, of Strasbourg, before quoted, who claims in his thesis, that the operation saved four women and seven children, out of nine cases; but the increased risk to the former would have made it of more questionable expediency than the *secondary*. The bold and successful operation of Mr. Jessop of Leeds,¹ England, in 1875, on a woman whose health was failing, and life in danger, will no doubt lead others to make the same attempt; and it is possible that under improved surgical management, future statistics may show a more inviting record than the past; but at present, this operation, according to history, appears to promise much more for the fœtus than the mother. Parry² reports nine operations where the child was viable, with a saving of two women and eight living children.

In view of the condition of Mrs. O. in January, it is very questionable whether we would have advised an operation, as we did unhesitatingly in May. She was then very much distended with fluid, her lower extremities were œdematous, and her general health by no means as good as it was four months later. There was great risk to be run during the false labour that was soon to take place, but this could hardly be equalled to the still greater one, to be incurred by a primary operation. It is therefore not to be regretted, that the question of operating was not presented at the time specified, but came up at a more favourable period, perhaps the most so that could have been chosen.

The changes that take place in the placenta, and its vascular connec-

¹ Trans. Obstet. Soc. London, 1876, p. 261.

² Extra-Uterine Pregnancy, 1876, pp. 229-30.

tions, and the greatly diminished vascularity of the cyst, especially when not adherent to contiguous viscera and the abdominal walls, are no doubt the chief reasons why the operation is less dangerous after the death of the foetus. There being no sac in the Jessop case made it more favourable in respect to danger from hemorrhage; but a well-formed cyst, adherent to the abdominal parietes, is of great advantage in preventing peritonitis, as the paritoneal cavity is not opened.

It has long been, and is still to some degree, an unsettled question, whether a foetus developed in the abdominal cavity should be removed during its life, within a limited period after death, or not until there are indications that an abscess is about to point, or has formed an opening, through the abdomen, vagina, or rectum. *The old method of procedure* was based entirely upon the efforts of nature to discharge the foetus; and the operator simply opened the abscess, or perhaps enlarged an already formed fistula, so that the foetus might be removed and the placenta subsequently discharged, if it could not be distinguished at the time.

The first operation of the second type mentioned, performed in this country, appears, as far as I have been able to ascertain, to have been that of Dr. Charles McKnight, of New York, which was reported after his death, to Dr. J. C. Lettsom, of London, in 1795, by the late Dr. James Mease of Philadelphia. As Dr. Mease graduated in 1792, was present at the operation, and reported the case after the death of Dr. McKnight, the woman must have been operated upon at some time between 1792 and 1795, the date not having been given. As the case of Dr. McKnight is one of much historical interest, I will give the prominent features of it.

The woman became pregnant twenty-two months before the operation, and presented the common symptoms of this condition during gestation. Labour set in at the end of nine months, but no child presented, and in time the pain ceased, but *there was no diminution in the patient's size.*¹ Her health was good but mind uneasy, and she went to New York for advice. The physicians consulted, agreed as to her condition,² "but differed respecting the treatment, whether the operation should be immediately performed; or as the woman enjoyed good health, and as it was impossible to ascertain the parts to which the placenta adhered, or which it might be necessary to injure, in the complete extirpation of the foetus, that the operation should be deferred until something like an external imposthumation should appear, that nature should thus point out the place and manner in which extraction should be performed."

Dr. McKnight, who was evidently a believer in surgical progress, advised an immediate operation, "before the woman's health should become injured, and the contiguous parts suffer from compression and putrefaction." Dr. Mease remarks: "the event has proved that he was right; and I confess, from the observation I made during the operation, that this reasoning and practice will always be found so."

The abdominal tumour lay chiefly to the left side; the foetal head could be felt in the left groin, and what was presumed to be a knee, above and to the right of the umbilicus. Dr. McKnight commenced his incision "on the left side, somewhat above the navel, and a little beyond the junction of the rectus and oblique

¹ This is very questionable, in view of the fact that the foetal head and knee could be felt, and that shrinkage is generally regarded as universal in these cases.

² *Memoirs of Med. Soc. London*, vol. iv. 1795, p. 343.

muscles, which he continued to the pubes." The fœtus proved to be of large size, and the bones of the head were removed to lessen its bulk; it was then extracted, but slipped and fell, so as to rupture the cord. This accident proved all-important to the woman, as the operator failed to find the placenta after a diligent search, and it had to remain intact. The fœtus, according to Dr. Mease, was contained in a closely adherent cyst, and the peritoneal cavity was therefore not opened. The discharge from the wound was abundant and offensive, and greatly reduced the strength of the patient; but she ultimately made a good recovery.

*What to do with the placenta,*¹ was for years the crucial question in this operation. Mr. William Turnbull² was probably the first to recommend that it should remain intact, as we learn by reading his report of an autopsy of a lady, who died from the effects of a ventral pregnancy; which was presented to the Medical Society of London, January 10th, 1791. He says: "*My firm opinion is, that the separation and expulsion of the placenta should always be left to nature, for the extraction will be generally fatal from the hemorrhagy following it.*"³ Dr. Mease, in his letter to Dr. Lettsom, contends for the same non-interference, but with more practical weight, because his opinion was backed by the successful issue of an actual trial of the method proposed; while that of Mr. Turnbull was simply based upon the danger of removal, without any evidence that the plan would not be fatal to the patient. Unfortunately for the benefit of humanity, these views were for a long period lost sight of, and we find in after years, strong objections made to the operation, on the ground of the supposed necessity that existed for removing the placenta, and the danger of hemorrhage and death from so doing. Thus we find in Blundell's work on Obstetrics, in 1840, page 480, "On the whole, however, considering the danger of the incisions, and *the risk of a fatal bleeding internally, when the extra-uterine placenta is taken away*, abdominal incision seems to promise very little success."

M. Chailly, 1844, also speaks of the extraction of the placenta as very difficult and dangerous, and recommends that the operation should be performed only where the woman is in imminent danger, or her life rendered a burden by suffering. (*Midwifery*, page 79.) Cazeau expressed the same opinion.

Prof. Behier, Paris, 1873, says, "I would not venture to propose it (laparotomy) notwithstanding the presence of the products of abnormal gestation, for a healthy looking woman who has *probably* before her, ten, fifteen, thirty, and even fifty years of *tolerable* existence."—(*Gaz. Hebdom.* 36, 1873.)

I could multiply opinions for and against the operation, both in the *primary* and *secondary* conditions of abdominal pregnancy, *i. e.*, where the fœtus is living, or has died, but will refer the curious to the work of Dr. John S. Parry, on *Extra-uterine Pregnancy*; what we have to deal

¹ See discussion in Trans. Obstet. Soc. London, Nov. 6th, 1872, vol. xiv. p. 318, 1873.

² Memoirs Med. Soc. London, vol. iii. p. 211.

³ Op. cit., vol. iv., 1795, p. 342.

with, being not so much the imperfect records of cases operated on, as the histories of those, who either declined the operation, or in whom it was postponed, that suppuration and pointing might take place. It is very well to compare the relative mortality of cases operated upon, (1) during the life of the fœtus; (2) after it has been dead a short time, and before the health of the woman has become impaired; (3) at a later period when constitutional disturbance makes it imperative; (4) and still more remote, when an abscess has formed and pointed; but what interests us is, to know how these postponed cases compare in results with those that have been operated upon before the health of the woman has failed. We read of spontaneous cures; of operations performed years after the death of the fœtus, when it has become decomposed and an abscess formed; but what is said of the number who wait patiently for relief from the operations of nature, and never reach the condition in which, according to the opinion of many, the operation is the most safe?

We read of women carrying extra-uterine children for more than fifty years, and dying of old age; but little is said of those who died before it was thought prudent to operate upon them, falling victims to rupture, convulsions, fever, diarrhœa, peritonitis, exhaustion, and septic poisoning.

The life of a woman carrying an extra-uterine fœtus is never safe from rupture, *sudden* disease and death; and this is particularly the case at, or soon after the death of the child, where the same is of mature growth, and developed in the abdominal cavity. When the fœtus is small, has ceased to grow, and is contained in its original cyst, in the Fallopian tube or ovary, it may be preserved for years without perceptibly impairing the health of the woman. It may remain almost unchanged; become shrivelled like a mummy; be converted into a species of adipocere; or undergo a process of calcification. In rare instances, even large encysted children have been found well preserved after some years. But in cases of secondary abdominal pregnancy, where there is no sac, or the same is incomplete, as in Mrs. O., the fœtus when dead may at any time decompose in immediate contact with the intestines, and peritonitis or septicæmia result.

The diagnosis of extra-uterine pregnancy being in some cases very difficult, the plan of tapping the cyst by aspiration and testing the fluid, or of drawing off a large quantity until the fœtus can be defined by palpation, has been adopted; but not with very favourable results to the patient in many cases; as this mode of procedure appears capable of precipitating a fatal termination, sometimes in a few days. We think that these tests should be only used in cases ready for and willing to submit to an operation, and that it ought at once to follow, if liquor amnii should be found.

The injection of antiseptic washes after an operation should be very cautiously employed, as, in the absence of a cyst, violent and rapidly fatal peritonitis may be at once lighted up. Where there is a cyst, there is generally much less danger. I know that the use of dilute Cond's fluid

and weak solutions of carbolic and salicylic acids is generally commended, and that they are frequently employed with apparent benefit; but it is well to bear in mind that they are sometimes as dangerous as the septicæmia against which they are made use of; and especially is this the case with the permanganate of potash.

A few years ago, Prof. D. H. Agnew, of Philadelphia, removed a mature fœtus, computed to have weighed ten pounds, from the vagina of a patient of Dr. Ellwood Wilson, by the post-uterine incision. There was no cyst, or a very imperfect one, the placenta separated without hemorrhage, and the woman did well for eight days, when it was proposed by a consulting accoucheur, to inject a weak solution of permanganate of potash into the pelvis, through the wound. This was done, causing at once a violent pain, followed by peritonitis, and death in twenty-four hours. But for this, there is every reason to believe that the case would have made a good recovery, and in an unusually short time, as there was no placenta to be removed by decomposition. It was a very unfortunate experiment, and should teach a lesson of caution in the future to obstetric surgeons. Non-encysted post-uterine pregnancies may be operated upon with success, even to saving the fœtus; but the parts are so susceptible to peritonitis, that the less they are interfered with in the after-treatment the better. I believe that whenever possible, the abdominal section should be preferred to the vaginal, and in this I am sustained by some of our most prominent surgeons.

As there are still many in our profession who oppose such operations as the one reported, and adhere to the ancient *waiting for imposthumation*, I will introduce a few cases to show what becomes of some of those who are not operated upon.

CASE 1.—Dr. Ramsbotham mentioned, in his *Midwifery*, the case of a woman who declined being operated upon for the removal of a mature fœtus, and died in a year, worn out with diarrhœa and low fever. The diagnosis was verified by autopsy.

CASE 2.—Dr. W. C. Perkins, of Philadelphia, reports a case in the *Am. Journ. of Obstetrics* for May, 1872, in which Drs. Goodell and Parry were called as consultants. A quantity of fluid drawn off in exploration proved to be amniotic, and the fœtus could be distinguished by abdominal palpation. Fœtal death was thought to have taken place on Nov. 29th, 1871, and the per-vaginum puncturing was performed on Jan. 15th, 1872. It was proposed to remove the fœtus by the post-uterine section, but the woman and her friends declined. She was apparently better at the next visit after the puncture; but pain and fever soon set in, and she died of exhaustion in six days after the examination. The fœtus was dead 53 days, and beginning to decompose; and the enveloping cyst was not adherent. The case was thought a reasonably fair one for the operation.

CASE 3.—Dr. Frederick P. Henry, of Philadelphia, has kindly furnished the notes of a case from which I extract the following:—

Mrs. D., a native of U. S., 24 years old, third pregnancy, first and second having been premature; troubled after first with some uterine malady, the principal symptom being constant leucorrhœa, for which she had undergone medical treatment. Called in Dr. Henry on July 29th, 1876, supposing herself to be in labour at full term. She had menstruated regularly until November, 1875; felt

the sensation of quickening in March, 1876; and had well-marked and frequent pains when examined, but the doctor found the os high up, undilated and rigid, although there was some show of blood. After several hours the pains ceased, and did not return until August 21st, when they were found strong and frequent, and the woman very restless and excitable. An examination revealed the same condition of uterus as before, except that the os was slightly opened; no presenting part could be felt. After waiting several hours with no advance, the hand was introduced under ether, and two fingers into the os, when a soft body was felt, giving the sensation of a placenta, but on more complete exploration proved not to be, as the fingers could be carried to the fundus without encountering any ovum. This condition was confirmed by Drs. Elliott Richardson, and Nichols, who were present; and again three days later by Dr. Goodell. The patient at this time was very weak; free from labour-pains; had much abdominal tenderness, and presented signs of peritonitis. "It was decided not to operate, on the grounds of the woman's feebleness, the fact that the fœtus was dead, and the existence of peritonitis. It was thought more prudent to wait."

Two hours after Dr. Goodell's examination, and this decision in consultation, the patient had a violent chill, followed by high fever, and a pulse of 140; after which she had at times frequent chills; profuse sweats; a very irritable stomach; and was exceedingly prostrated; pulse and temperature running up to 137 and 103.7°⁰. She died on August 30th, the ninth day after the severe labour-pains set in; from "*septicæmia due to absorption of putrid matter from the decomposing fœtus.*" The fœtus was a female, full size, and computed to weigh more than six pounds. As it was thought to have died on August 21st, it was only dead nine days when the death of the mother took place; exploration by puncture had no doubt hastened the decomposition of the fœtus.

CASE 4.—Dr. Edward L. Duer, of Philadelphia, has also been kind enough to send the records of an unpublished case, of which the following is a condensed abstract:—

Mrs. F., 37, native of Massachusetts, mother of three children, and anticipating the birth of a fourth in Oct. 1875. She stated that in about the third month she had had quite a sharp attack of peritonitis, and was under the care of Dr. Washington L. Atlee, but no suspicion of the case was then entertained. It soon passed off, and her size increased without any unusual symptoms. On Sept. 18th Dr. Duer saw her in consequence of an attack of uterine pain which lasted but a short time, and was accompanied by a slight show of blood; found os uteri high up, and of remarkably small size; relieved attack by anodyne suppositories. Oct. 4th had another attack, relieved temporarily in same way. Oct. 15th severe continuous pain, with more decided hemorrhage. Having a disabled hand, called in Dr. Goodell to conduct the labor. Uterus found "much enlarged, dragged out of the pelvis, and pushed forcibly over to the left side, whilst the enlarged os and cervix were presenting behind the pubes, and correspondingly difficult to reach." Abdomen enlarged obliquely upward from the left iliac region to the lower border of the right lobe of the liver. At a point a little above and to the right of the umbilicus there was an elevation about three inches in diameter, where the presumed fetal cyst seemed about to point, the interposing tissue appearing to be not more than half an inch in thickness. The limbs of the child could be here felt, and the head was thought to lie in the left iliac fossa.

After a few hours of rest, Prof. Ellerslie Wallace was added to the consultation; feeble motion was felt in the fœtus by the patient, and the heart sounds could still be distinguished, but both soon disappeared. "The general conviction of the consultants, nevertheless, was in favour of delay, with the view of securing a better condition for operative interference."

The patient took a fair quantity of liquid food; slept well under anodynes; had no marked peritonitis, or great rise of temperature, but all the time a high pulse. "The temptation to operate, not in the canonical way, but by incision into the cyst-like prominence at the side of the umbilicus, was constant and great; but in accordance with what then seemed a better judgment, the temptation was

put aside just too long." Consultations were held daily for sixteen days, but at no time could all agree to take the responsibility of operating.

On the evening of the last day of the consultation, after having appeared much better than usual, Mrs. F. was suddenly seized with agonizing pains, followed at once by a state of collapse, and died in thirty minutes. No autopsy was allowed. Dr. Duer says: "My own reflection on this case is the regret of non-operating; in the light of present knowledge, of enhanced chances by so doing, and the danger of delay in operating, in the hope that adhesions may form and an abscess point, so that the fœtus may be cut down upon and removed with less risk of peritonitis, I believe our treatment would have been far different, and possibly have furnished us a different result."

As Dr. Duer says of his case, the delay was fatal. In all probability death resulted from rupture of the cyst-wall, an accident not uncommon at the maturity of an abdominal pregnancy. It is to be regretted that the patient was not examined post mortem, but in similar cases that have been the cyst was found to have given way. More progress has been made during the last ten years, and especially the last six, in enlightening the profession upon the treatment of these cases, than in any former period. We are beginning to learn that the cautions of the past were in many instances founded in error, and that there is more promise often in a bold and prompt use of the knife. Every failure by delay, and every success by an operation, has an influence in converting those in interest to the new method of treatment. My extensive researches in American Cæsarean cases convinced me that theoretically there ought not to be a very high rate of mortality in laparotomy for the removal of an extra-uterine fœtus after death, at or near maturity; and a more direct investigation proves that I was correct. It having been satisfactorily settled that *the placenta is not to be touched, that the cyst is to be stitched to the abdominal parietes*, and that *the lower part of the wound is to be kept open*, there is much less risk to be apprehended than formerly from the operation, provided the condition of the woman is reasonably good at the time of its performance. There is less danger of peritonitis and septicæmia than where the uterus has been incised after a long labour, and there ought to be as many recoveries as in Cæsarean cases early operated upon, or three saved to one lost. But even this may not be the limit of success, as Dr. Thomas saved all of his cases in New York, a much better result than has followed his laparo-elytrotomy.

I could multiply cases to prove the same point, but the four given are enough to show that to wait is often to lose the patient. As there is evidently much danger at the maturity of the fœtus, it becomes a serious question whether it would not be safer to operate in the eighth month than to wait until after the false labor is over and fœtus dead. So many women have lost their lives in the ninth month, or soon afterward, that it would appear as if the risk in operating should be less than in postponing; but this has yet to be tested in the future. One obstacle is the great difficulty in diagnosis, and the want of agreement in consultants. A woman may cease to menstruate (*from diseased ovaries*); become enlarged during

nine months (*from a benign uterine tumour*); feel confident that she has quickened (*when there is no fœtus*); have her breasts affected sympathetically (*when not pregnant*); and present many of the sympathetic evidences of this condition, thus misleading her physician, who fears to try the uterine sound. False labour may even set in at the end of nine months; but there is no uterine hemorrhage as in extra-uterine pregnancy;¹ and the abdomen does not diminish in size afterward, by absorption of the liquor amnii, as it almost invariably does where there is a fœtal cyst. The two important tests, of labour-pains with hemorrhage and subsequent diminution of abdominal development, cannot be obtained in time to make them of any value in a *primary* operation, and we are forced to make a diagnosis from other evidences. The fœtal heart may be heard distinctly in a normal location; the os uteri may feel as in a uterine fœtation; the uterus may be lifted behind the pubes; and the enlargement in Douglas's cul-de-sac be mistaken for the reflexed body of the organ; and the sound may be arrested in the uterus at a normal depth when but half introduced, and yet the fœtus be in the abdominal cavity.

The facts and errors enumerated have all been taken from actual cases, many of them in the hands of celebrated men; and even an exploratory incision has not revealed the true condition, as subsequently proved by autopsy. We are therefore to exercise the greatest possible precaution before proceeding to remove an extra-uterine fœtus during its viable period.

The experience of Dr. T. Gaillard Thomas, of New York, in extra-uterine cases, is very encouraging to any one who desires to be upheld in a decision to operate, rather than delay, and goes to show that laparotomy, under careful management, may prove less dangerous than any other plan of treatment. He has had fourteen cases of extra-uterine pregnancy, all within the last ten years. Nos. 1, 2, 5, and 13 were all early tubal cases, seen in consultation after the cyst had ruptured; and all died. In No. 13 the Doctor was very anxious to open the abdomen, and arrest the bleeding by ligation; but his diagnosis was not concurred in, or his plan acquiesced in. The lady died in sixty hours, and an autopsy revealed the fact, that the sac-wall was slightly broken, by which a small artery had given way,

¹ Even the test of hemorrhage during gestation, or the false labour, would appear not to be infallible. In a case observed by Dr. William R. King (*Richmond and Louisville Med. Journ.*, Sept. 1868), there was no uterine discharge, from the cessation of the menses, until their natural return, as after a normal labour. Shrinkage occurred and continued for two years, when the cyst was of the size of a uterus at five and a half months, and occupied the left side of the abdomen, where the tumor was first discovered. At the time of the false labour the movement of the fœtus was strongly marked. The woman was in good health six years afterward. From some peculiarity there could either have been no decidua, or it was thrown off at the regular menstrual period immediately following impregnation, as I once observed in a tubal case, and was overlooked, this menstrual act being counted as the last before conception.

causing death by a slow hemorrhage. In Dr. Thomas's opinion, this hemorrhage could have certainly been arrested; and it is much to be regretted that the operation was not tested in so promising a case.

Nos. 3 and 4 were early cases which he treated by puncture with a small trocar; the first was followed by pain in twelve hours, and death resulted with symptoms of rupture. The second was in the third month, and gave great relief; septicæmia developed on tenth day, and death resulted.

Nos. 6, 7, and 8 were all early, and left to nature; No. 6 passed the fœtus by the rectum, as did also No. 8, and both recovered. No. 7 died of septicæmia; one of the three, in consultation, opposing interference.

No. 9 was a left tubal pregnancy of three months, operated on by the post-uterine incision, with a galvano-cautery knife. The lady recovered.

No. 10 was an abdominal pregnancy of thirteen months' duration, with a full-grown fœtus. Operated upon by laparotomy; recovered.

No. 11, the same; twenty-two months' duration; fœtus eight pounds; the same operation and result.

No. 12, the same; seventeen months' duration; fœtus eight pounds; same operation and result.

No. 14 was a left tubal pregnancy of three months; galvanic battery twice applied. Labour-pains severe after second application, and fœtus expelled into uterus and out by the os. Patient recovered. Sound measurement before treatment $3\frac{1}{2}$ inches. Uterus found normal in shape after recovery. Case reported by Dr. Charles McBurney in *N. Y. Med. Journ.*, March, 1878, p. 273.

Thus we have four operations for removal of fœtus, all successful. Two punctures, both fatal; three left to nature, with one fatal, all pointing into rectum; four early tubal ruptures, all fatal; and one tubal, discharging by the uterine cavity, with recovery. It certainly looks as if it was safer to remove the child by the abdominal section than to try any other plan of management.¹

When the Dieulafoy aspirateur was first introduced to the profession, it was thought that tapping the cyst with it, so as to destroy the fœtus if in the early months, or lessen the danger of rupture by tension, if already dead, might be a valuable method of treatment; but aspiration has been found very unsafe, even when performed with a very small tube. It has been proposed to inject solution of morphia, to poison the fœtus; and to prevent septic poisoning, after removing the fluid, by injecting antiseptics into the cyst. The first of these experiments is claimed to have succeeded in the hands of Prof. Friedrich (*Virchow's Archiv*, xxix. 3. 4), who made four injections, and claims to have allayed the pain, and arrested

¹ I have purposely given a very condensed record of Dr. Thomas's cases, as he has promised to present them in full, as the basis of an article to be shortly published; some have already appeared, as 9, 10, and 14.

the growth of the fœtus. He also says that the fœtus was absorbed, which I hardly believe possible on physiological grounds.

In performing the operation upon Mrs. O., Dr. Atlee had but one object in view, the best interest of the patient; to which he made all matters of personal ambition or scientific inquiry subservient. He first became convinced that it was safer to operate, under the circumstances, than postpone; and then entered upon the operation with very sanguine hopes of success, to accomplish which he determined to try no experiments, and to avoid everything in the way of handling that might endanger the case. He was, therefore, in no hurry in cutting into the abdomen; did not sponge out the cyst, but simply absorbed the fluid as it escaped, and did not introduce his hand into the abdomen, either in removing the fœtus, or to ascertain the attachments of the placenta. The opening of the cyst required $5\frac{1}{2}$ minutes; removing fluid and fœtus, $12\frac{1}{2}$; and dressing the wound, 15 minutes; in all, 33 minutes from commencement to putting the woman in bed. When I cut the funis it resisted the scissors like a sprout of asparagus, and the cut surface presented no trace of vascular structure. The cord was of a dead-green colour, and had undergone a species of carnification, which had, probably, also affected the placenta. The incision in the linea alba started but three arterioles not larger than bristles, and the blood lost was unusually trifling.

Soon after the operation I counted her pulse at 98; and it is said to have been as low as 84 in the afternoon; but I have never found it as slow at any time since. The day before the post-placental abscess burst into the vagina I counted it 118, which, I believe, was the highest point reached. On the thirty-eighth day I found it 96; and on the fifty-first day still as high as 90. She had at this date (July 8) no pain on defecation or urination, no abdominal tenderness under pressure, and her tongue was perfectly natural. There was still a small opening in the abdominal wound, through which there was discharged daily about a tablespoonful of thin, sero-purulent fluid; but no tissue-shreds had passed for more than two weeks. She menstruated naturally, as to duration and amount, on July 1, *et seq.*; and said that she felt well, and had regained the flesh lost by the operation and sickness. There was nothing to indicate any trouble in the future, and the changed character of the discharge gave hope of an early closure of the fistula.

There has been a growing disposition on the part of several leading accoucheurs in this city, manifested for a few years past, to depart from the conservative method in the management of abdominal pregnancies, and recommend the early removal of the fœtus by incision through the vagina or abdomen; reasoning from analogy that this should not be so fatal a method of relief as has generally been believed. In two instances the fœtus was removed by vaginal incision, but both women died; one case being that of Dr. Wilson, already mentioned, and the other an opera-

tion by Dr. Albert H. Smith, with Paquelin's thermo-cautery knife, in which he encountered the placenta in the line of incision. The operation by Dr. Atlee, as far as I have been able to ascertain, is the first one of its kind that has been performed in Philadelphia. The dead fœtus has been removed after the pointing of an abscess, but in no instance before suppuration had commenced, as in his case. The fatal cases reported within a few years that it is now thought might have been saved by opening the abdomen promptly, will no doubt bear fruit in the future in the form of a more decided disposition to operate, and a greater hopefulness in the result to the women. The successes of Drs. Thomas, Jessop, and Atlee should certainly encourage others to follow their example.

713 LOCUST STREET, July 30, 1878.

ARTICLE II.

ON THE RELATIONS BETWEEN PROGRESSIVE ATAXY AND SPASMODIC SPINAL PARALYSIS. By JULIUS ALTHAUS, M.D., M.R.C.P. Lond., Senior Physician to the Hospital for Epilepsy and Paralysis, Regent's Park, London.

RECENT microscopic investigations of the anatomical changes in these two diseases have shown that the lesion does not originally affect the entire extent of the several columns of the spinal cord, but only a certain portion thereof. In progressive locomotor ataxy the morbid process begins in that part of the posterior columns which Henle has termed the "Keilstrang," funiculus caudatus, and which the French anatomists call the "rubans" or "bandelettes externes;" that is to say, the external portion of the posterior column, which is in close proximity to the posterior roots of the spinal nerves; while the internal portion of the same, which Burdach has called the funiculus gracilis, but which is now generally known as Goll's column, is not primarily affected, but only suffers later on, when the disease spreads to the other portions of the nervous matter, such as the posterior roots, the posterior cornua of the gray matter, etc. On the other hand, in spasmodic spinal paralysis, spasmodic tabes dorsalis, or lateral sclerosis of the spinal cord (Erb, Charcot), the lesion attacks first the posterior portion of the lateral columns, which Flechsig has termed the crossed pyramidal column, and which is composed of fibres derived from the opposite cerebral hemisphere. This is distinct from the lateral column proper, which is situated more anteriorly, and the direct cerebellar column, which lies more to the rear. The pyramidal column is in this disease found studded with wedge-shaped gray patches, reaching anteriorly as far as the lateral column proper, exteriorly as far as the pia mater, and interiorly as far as the posterior cornua. This peculiarity in the localization of the disease distinguishes it anatomically (α) from

Türk's degeneration, or secondary lateral sclerosis consequent on cerebral hemorrhage, in which the patches are rounded, not wedge-shaped, and do not spread exteriorly as far as the pia mater; and (*b*) from secondary sclerosis after myelitis, hemorrhage into the cord, etc., where the gray patches do not extend posteriorly as far as the posterior cornua, but where a small intermediate layer of healthy white matter remains between them and the sclerosed tissue.

In analyzing the various symptoms which we meet with in posterior and lateral sclerosis, we find that the most important in the former are referable to sensory disturbance and want of motor coördination; while true paralysis, with muscular spasms and rigidity, may be considered characteristic of the latter. I will now endeavour to trace these symptoms to morbid alteration of the normal functions of the affected parts, such as they are known to us from the present teaching of experimental physiology.

That sensibility in its various forms should suffer in disease of the posterior columns, is only what might be expected, inasmuch as these parts have been experimentally shown to contain the chief paths for the conduction of the senses of touch, pressure, temperature, and tickling. In accordance with this we find such symptoms as the following: a feeling of constriction round the chest, abdomen and limbs; numbness and tingling in the legs and feet; a sensation in walking as if the patient stepped on bladders or cotton; tardy sensation, so that several seconds are required for appreciating an impression which has been made; loss of the keenness of touch, so that the patient is unable to tell the nature of an object which is given him to touch, without the help of his eyes; diminution or loss of the muscular sense, so that, without looking, the patient is not aware of the position of his limbs, or of any changes which are made in it by others. All these signs, and in the later stages of the disease, cutaneous anæsthesia, are amongst the commonest symptoms of ataxy, and absent only in the most exceptional cases.

A prominent symptom of *tabes dorsalis* is a peculiar kind of pain which darts through the limbs like lightning, occurs chiefly at night, selects mostly the lower extremities, but spares no part of the body, is sometimes neuralgic in character, so that there is a paroxysm and afterwards an interval of rest, while at other times it is more continuous, and lasts in various degrees of intensity for weeks and months. Now it has been shown that the paths for the conduction of the sensation of pain are not situated in the posterior columns, but in the central gray matter; and as the pain to which I have just alluded, is one of the most constant earlier symptoms of posterior sclerosis, and occurs at a period when the central gray matter is still unaffected, it must be referred to irritation of the posterior roots in Henle's "*Keilstrang*," where the disease is located in the first instance.

A far greater difficulty is experienced in physiologically explaining the symptom of ataxy, or want of coördination, which is not only locomotor, as usually stated, *i. e.*, perceptible in complex movements, but also *static*; that is to say, that there is a difficulty or impossibility of keeping the arms and legs, the body, and in some cases even certain muscles supplied by the cranial nerves, for any time fixed in certain positions. The atactic patient has indeed not only great difficulty in walking, but cannot stand erect with the feet close together. Where the disease affects the cervical cord, he finds it impossible to write, dress, play musical instruments, etc., and cannot well keep his arm or hand stretched out in a certain direction. This symptom of locomotor and static ataxy is a true motor phenomenon, and not dependent upon anæsthesia, as was formerly believed. That such is the case, is shown by the fact that the degree of ataxy is not at all proportionate to the degree of anæsthesia which may be present, inasmuch as the one is occasionally found slight, and the other severe, and *vice versa*. Moreover, complete anæsthesia of the limbs may exist without simultaneous ataxy, which alone renders it evident that this latter is nothing but a symptom of disordered motion.

As both locomotor and static ataxy occur with great regularity in diseases of the posterior columns, we would naturally draw the inference that these structures are the centres for the coördination of complex movements; yet Goltz's experiments have shown unmistakably that no such centres exist, either in the posterior columns, or anywhere throughout the entire extent of the cord; on the contrary, they are situated in the brain, residing more particularly in the corpora quadrigemina, the optic thalamus, and the cerebellum. If therefore the posterior columns are not actual centres, we might at least expect them to contain the paths by which the coördinating impulses travel from the brain to the muscles. But even this supposition is controverted by Woroschiloff's experiments, which tend to show that, at least in the rabbit, these paths are situated in the middle third of the lateral columns of the cord, and do not touch the posterior columns at all. Physiology and pathology seem therefore in such a simple case as this for the present hopelessly at variance with each other; and we must leave to future observations the task of reconciling these apparently discrepant phenomena.

Experimental destruction of the posterior columns in animals does in no way impair the voluntary motion of the parts behind the lesion; and in accordance with this we find that in the first two stages of sclerosis of these columns there is no loss of voluntary power over the muscles, or paralysis. The patient may be unable to walk or to use his limbs for any useful purpose, but is still in possession of motor power, so that when he is sitting or lying down, he can move his legs, cross one over the other, etc., and it is only in the later stages of the disease, when the sclerosis

creeps up to other portions of the spinal centre, that true paralysis may be observed.

The functions of the lateral columns of the cord are still to a great extent enveloped in obscurity. There is diversity of opinion amongst physiologists with regard to their being concerned in the conduction of sensations; but it appears highly probable that each lateral column contains sentient fibres for both extremities, and that these fibres cross over from one to the other side of the organ. Pathological observation does not quite tally with these data, for in a number of cases of lateral sclerosis symptoms in the sphere of sensibility are entirely wanting, while in some we find pain, tingling, numbness, a feeling of heat and cold in the skin, etc.; but even in these latter cases the sensory disturbance only occurs in the commencement of the disease, and is very moderate in degree. On the other hand, the lateral columns are generally acknowledged to contain the principal paths for the voluntary movements for the extremities, for which, however, they are associated throughout with the large ganglionic masses of the gray anterior cornua, and the anterior roots of the spinal nerves. In accordance with this we find that in lateral sclerosis loss of motive power in the extremities, constitutes one of the principal symptoms.

This loss of power is at first very slight. The patient feels weak in the legs, and has a difficulty in going up and down stairs; after walking a short distance he is greatly fatigued. There is great difficulty in lifting the feet from the ground; they are apt to shuffle along it, and the soles of the boots, by scraping the ground, are sooner worn out at the toes than formerly. The patient soon takes to sticks or crutches. Coincident with the loss of power there is motor irritation, as shown by twitches, cramps and convulsions, which are apt to occur after fatigue, but often come on without any apparent exciting cause, and with considerable regularity, nay, periodicity, at certain hours of the day. After a time, the muscles assume a degree of rigidity, which in its turn renders voluntary movements more difficult, and causes resistance to passive movements. The patient finds it difficult to stoop. The legs resist flexion, extension and abduction, and the foot assumes the position of varo-equinus. This state of things induced Seguin to describe the complaint as "tetanoid paraplegia."

In consequence of these differences in the pathological condition of the lower extremities, the gait of the patient affected with ataxy forms a complete contrast to that which is seen in one suffering from lateral sclerosis. The ataxic patient uses his eyes as crutches, and is constantly looking at his feet in order to guide their movements. He walks in a jerky and irregular manner, puts his feet down with force, throws the toes heavily forwards and outwards, staggers in turning round, and has to manœuvre considerably with his arms in order to prevent himself from falling. On

closing the eyes, or in the dark, he is particularly unsteady, and liable to fall. The patient with lateral sclerosis, on the other hand, seems to be, as it were, fixed in a vice. While he has no difficulty in standing, the legs appear so stiff that he is almost unable to get the feet from the ground; he walks on tiptoe; the whole body seems to join in a spasmodic effort, and is thrown forward, in order to aid the action of the legs. There is tendency to fall forwards; yet the help of the eyes is not sought in walking, and light or dark makes no difference in it.

The faculty of reflex action has been shown to reside in the ganglionic cells of the central gray matter of the cord, where sentient impressions are conveyed from the posterior roots of the spinal nerves to motor paths in the anterior roots. Destruction of the gray matter annihilates reflex action. Thus we find that in anterior polio-myelitis, where the anterior cornua are disorganized by inflammation, no reflex movements can be elicited, although tickling of the soles is distinctly perceived, and sensibility altogether normal. Neither the posterior nor the lateral columns contain any centres for this faculty, and coincidently with this we find that in posterior as well as lateral sclerosis the reflex function of the skin and mucous membranes is in a general way preserved. A singular and important feature of the two diseases which we are now considering is, however, the behaviour of *tendinous reflexion*, which appears to present a marked contrast in them. Westphal and Erb have shown that reflex movements may be elicited, independently of cutaneous stimulation, by giving a tap or blow with the fingers or a hammer on certain tendons, such as that of the rectus femoris, the tendon Achillis, and that of the triceps muscle of the arm. Such a tap or blow is generally answered by a contraction in the muscle or set of muscles connected with the tendon, and is not owing to mechanical concussion of the muscular substance, as Westphal at first believed, but to true reflex action, the centre of which for the legs appears to be situated in the lower portion of the spinal cord (Schultze and Fürbringer). It is best shown by a patient being made to sit on a table, so that the legs dangle about; the tendon of the rectus is now gently struck, when the foot is seen to be jerked forward. That it is stimulation of the nerves of the tendon, and not of the skin, which produces this phenomenon, is shown by the circumstance that it occurs after the skin has been rendered insensible by the ether-spray, and that it may be present where cutaneous reflexion is diminished or gone, and *vice versa*.

Now tendinous reflexion appears to be entirely gone in ataxy as soon as this disease has become fairly developed; while it is, on the contrary, greatly increased in lateral sclerosis. Thus, when a patient suffering from this latter complaint is told to stamp on the floor with his foot, the whole limb is thrown into a state of tremor, which may continue for hours. This tremor may also be excited by suddenly flexing the foot, and can be

generally arrested by extending the same. It thus comes to resemble the phenomenon known by the incongruous name of "spinal epilepsy." Such reflex movements are in lateral sclerosis not only more readily induced in those tendons in which they habitually appear in healthy subjects, but they also occur in other tendons in which they are usually absent, such as those of the tibiales and semitendinosus muscles of the lower, and the biceps, deltoid, supinator, and extensor digitorum communis muscles in the upper extremity. In doubtful cases the opposite behaviour of tendinous reflexion in posterior and lateral sclerosis may therefore be utilized for the purpose of diagnosis. The increase of the phenomenon in lateral sclerosis cannot be explained by irritation of the gray matter, as this does not share in the affection, but has to be accounted for by the influence of inhibition. The centre for the inhibition of reflex movements is situated in the corpora quadrigemina, and paths for its conduction are found in the lateral columns. We shall therefore be justified in assuming that the increase of tendinous reflexion in lateral sclerosis is owing to the cessation of arrival of inhibitory influence from the brain in the muscles, from interrupted connection.

Symptoms on the part of the vaso-motor nerves and of those which preside over nutrition, are rare in lateral as well as posterior sclerosis, unless the lesion has invaded other portions of the cord. An exception to this rule is however found in some forms of ataxy, where a peculiar affection of the joints, more particularly of the knee, shoulder, elbow, and hip is apt to occur. The joints, as well as the subcutaneous cellular tissue in their neighbourhood, become subject to a non-inflammatory swelling, which is unattended by pain, tenderness, redness, or heat. This lesion is nevertheless of a serious nature, as it leads to atrophy of the epiphyses, dislocation, and consequent deformity and uselessness of the limbs. Excessive fragility of the bones may also be present. These symptoms can only be owing to more or less sudden failure of nutrition in the parts affected; but it has not yet been ascertained which portion of the cord is to be held responsible for this condition.

The principal centre for the movements of the bladder, rectum, and male organs of generation, has by physiologists been found in the lumbar enlargement of the cord; but the more precise seat of this centre has not yet been ascertained. Judging from pathological observations, I should say that it is not situated in the lateral columns, for in lateral sclerosis there are no symptoms pointing to loss of function in these viscera. It is true that Dr. Gray, of Long Island College, has quite recently recorded a case in which there was involuntary action of the bladder if the desire to urinate was not quickly gratified; but this is most exceptional, and most likely owing to extension of the disease to other parts. In posterior sclerosis, on the other hand, either irritation or failure in the action of the bladder, bowel, and sexual organs, is the rule, and appears at a comparatively early

stage of the disease. Total loss of function in these parts is only observed in the later period, when the posterior cornua of the gray matter have permanently become sclerosed. Even where the patient is unable to walk, the sexual function may still be in existence, as shown by the following case which is now under my care at the Hospital for Epilepsy and Paralysis, Regent's Park:—

J. R., aged 40, single, a commercial traveller, was admitted under the care of Dr. Althaus on January 25th, 1878. He has travelled much in the tropics, undergone great exposure to cold and heat, and lived a wild life, exceeding in sexual relations as well as in drinking. Five years ago he had an attack of delirium tremens. He also has had a soft chancre and gonorrhœa, which resulted in stricture of the urethra, but never had constitutional syphilis. Two years ago, when in South America, he first felt difficulty in walking, and was some time afterwards admitted into the Hospital of Buenos Ayres, where he remained three months. He noticed that he walked much worse in the dark than in the daytime, and that he had constantly to look at his feet for guiding the movements of the legs. He got better and worse alternately, but two months ago he was still able to walk about, and could at a stretch go on for three miles. One day, however, when about to cross a street, he had to jump in order to avoid being run over by a cab. This seemed to give him a strain in the back, and from that time forward he has gone down steadily.

Present state: The brain is quite free from disease, but the third left cranial nerve is affected, there being paralysis of the left rectus internus and the inferior oblique muscles. In consequence of this the patient is unable to turn the left eye inwards and upwards. There is crossed diplopia and divergent strabismus. There also appears at first sight to be ptosis of the left upper eyelid, but on closer examination it is found that the levator palpebræ superioris muscle is not paralyzed, but is intentionally put out of action by the patient in order to avoid the annoyance of double images; for the eye, although habitually closed, can be opened at request without any difficulty. The ocular muscles of the right eye and all the other cranial nerves are quite healthy.

The cord-affection in this case is at present confined to the lumbar enlargement. The arms and hands are in their normal state, and there is no disease of the thoracic and abdominal viscera. Incomplete anæsthesia commences in the hypogastric region, and spreads from there to the lower extremities, being particularly marked in the feet and legs, and less so in the thighs and hips. He feels the ground quite soft, like cotton or velvet; is still able to feel the prick of a pin, but has a sensation of great numbness in the legs. The power of walking is entirely gone, and the patient can only stand when supported on both sides, yet he is well able to cross one leg over the other when sitting, and has no difficulty in moving the legs in the recumbent position. The nutrition of the muscles of the lower extremities has suffered a good deal, but evidently more from disuse than from disease of the anterior cornua, for they respond well to the faradaic and galvanic current. Cutaneous reflex excitability is preserved, but tendinous reflexion absent. The bladder is weaker than formerly, but there is only occasionally retention. The bowels are regular. Sexual desire is absent, and the power diminished, but not gone, for the patient is occasionally subject to nocturnal emissions of semen, and has erections on first waking in the morning.

On the other hand, I have found that in inflammation of the anterior cornua of the lumbar enlargement, with consecutive muscular atrophy, the bladder and rectum continue to act normally, while the male sexual function is at once and completely destroyed. It therefore appears to me probable that the posterior columns are not the centre, but contain only the paths for the conduction of motor impulses to the bladder, rectum, and sexual organs; that the true centre for these parts is situated in the central gray matter; that the posterior cornua of this substance are the centre for the bladder and rectum; and that the anterior cornua contain an important centre for the male sexual organs.

The mode of development of both lateral and posterior sclerosis is, as a rule, extremely chronic and protracted over years, nay, decennia. In both, the morbid process usually commences in the lumbar enlargement of the cord, owing to which the symptoms appear simultaneously and to an equal, or nearly equal, extent in both lower extremities. The disease has a tendency to remain limited to this neighbourhood for years, but to spread within it from one set of nerve-cells and fibres to another, so as to gradually disorganize the whole structure. There is, however, no continuous progress of this sort, but it goes on, as it were, by fits and starts; for a time, the morbid process appears arrested, after which, mostly owing to unfavourable external influences, a fresh start in the wrong direction is made, which stops again at a certain point. The course of the complaint is particularly slow where the patients are placed in favourable conditions, and are not obliged to expose themselves to cold and wet, or to undergo exertions and privations; and where, in addition to this, they resign themselves to a quiet and uneventful life. In the contrary circumstances, the development of the disease is far more rapid.

After a variable time, the sclerosis spreads upwards through the dorsal portion of the cord to the cervical enlargement, where it assumes the same course of slow disintegration. Even then, however, neither lateral nor posterior sclerosis has the tendency to shorten life, unless the morbid process spreads more transversely through the organ, when cystitis, bed-sores, and blood-poisoning are apt to become developed; or where it creeps up to the medulla oblongata and its motor nuclei, when death takes place from failure in the power of the cardiac and respiratory centres, or through inanition, from loss of the power of swallowing. In other cases, the patient succumbs ultimately to certain complications, such as typhoid fever, pulmonary consumption, bronchitis, pneumonia, affections of the heart and liver, and other diseases which have no particular connection with the sclerosis.

There are, however, some peculiarities in the course of both affections to which a short allusion must be made. The participation of the cranial nerves in the first stage of posterior sclerosis is one of them; and we are therefore led to think that ataxy has, even in the beginning, more ten-

dency to generalization than lateral tabes. In the latter, it is not uncommon that the clinical aspect of the case is at first more like that of hemiplegia than paraplegia, the affection beginning in one leg and then creeping up to the arm of the same side; or it assumes the form of cervical paraplegia, beginning in both upper extremities and gradually descending to the lower ones. Anomalies of this description also occur now and then in posterior sclerosis.

In cases where spasmodic spinal paralysis assumes the form of hemiplegia, the clinical features of the case resemble very closely those of cases of cerebral hemorrhage, with consecutive sclerosis of the crossed pyramidal column of the cord, of which the following is an instance:—

C. B., a fish-salesman, aged 40, married, admitted under the care of Dr. Althaus on February 14th, 1878. Seven years ago, while attending to his business, he had an attack in which he to some extent lost his speech and the use of his left side. He could speak, but thickly and with an effort, and could walk a little, but kept falling down as he went on. He was admitted into the London Hospital, Whitechapel, but was not able to resume his business when he left it. Twelve months after the first attack he had another, which was more severe than the first, and took the speech and use of the left side away more completely than the first. Consciousness was also lost for some time. He attributed his illness to anxiety and excitement in business, and had had very heavy losses just previous to the first attack. His parents were nervous people and had died early; and he had for some time previous to the first attack suffered from headache and indigestion.

On examination, it was found that the speech was somewhat thick and indistinct, but quite fluent. There was no loss of words. The patient's manner is peculiar, somewhat silly; his memory is not good. The cranial nerves are quite healthy; there is loss of power in the left side, combined with muscular rigidity. The arm is abducted from the body, and the elbow, wrist, and fingers are in a state of extension. There is great difficulty in flexing and supinating the arm, and in bending the hand and fingers, and considerable resistance to passive movements in that direction. The gait of the patient is most characteristic and indicative of lateral sclerosis; he walks on tiptoe with the left leg, which seems to be fixed in a vice, so awkward and slow are its movements. The foot is inclined to scrape the ground as it shuffles along, and there is tendency to fall forward on that side. The rigidity is marked in the rectus femoris, and there is difficulty in flexing the leg and foot. The reflex action of the skin and of the tendons is increased, more especially in those of the triceps of the arm and the rectus. There is slight wasting of the muscles, but not more than could be attributed to disuse; and the faradaic and galvanic response is slightly less than on the healthy side. Sensation is not affected, and the chest and abdominal organs are healthy.

It is evident that in this case there was at first hemorrhage from one or several miliary aneurisms in the arterioles springing from the Sylvian artery and supplying the right corpus striatum, thus causing left hemiplegia. There was never any real aphasia, but only such affection of speech as is met with apart from disease in Broca's convolution. In con-

sequence of the effusion of blood, secondary sclerosis (as first described by Türk, of Vienna) set in in the posterior portion of the lateral column, which is composed of fibres derived from the opposite cerebral hemisphere; and, as the same portion of the cord is also affected in spasmodic spinal paralysis, the physiological similarity in the symptoms is easily understood. The cause and history of the two maladies are, however, quite different, the one being primary, the other secondary sclerosis. Anatomically, they differ likewise, inasmuch as the gray patches in secondary sclerosis are rounded, while in the primary form they are wedge-shaped; likewise, in primary sclerosis, these patches spread exteriorly as far as the pia mater, while in the secondary form they stop short at some distance from that membrane.

The chief cause of lateral tabes appears to be cold. Sleeping in a damp bed, getting a thorough wetting during a day's shooting, etc., is generally mentioned by the patients. Whether hereditary tendency, lead-poisoning, sexual excesses, and syphilis, play any part in the causation of the diseases, remains uncertain. The patients I have seen were all males, between 35 and 50 years of age; yet it occurs in women likewise, and also later and earlier than the period just mentioned.

The causes of posterior sclerosis are much better known. Some forms of it are clearly hereditary; but more frequently the neurotic constitution is not marked in the parents of the patients. Cold, sexual excesses, over-exertion, and depressing mental emotions are the most frequent amongst them; and the disease is particularly developed where all these different agents act together. Accidents, more especially a fall from horse-back, are often mentioned in the history of these cases; yet ataxy is rarely seen after railway accidents, and in those cases where injury was mentioned to me as a cause, the interval between its occurrence and the outbreak of the malady was so long that it appeared difficult to assume a causal connection betwixt the two.

The *prognosis* in both lateral and posterior sclerosis is, in a general way, unfavourable, as soon as the symptoms have become fully developed, yet every physician who has seen much of these diseases knows of some cases in which complete, or almost complete recovery has taken place. Mostly, however, we must be satisfied if we succeed in arresting the progress and relieving the symptoms of the complaint. The prognosis depends greatly upon external circumstances and the mode of life adopted by the patient. Those who have to work for their living are worse off in this respect than those born with the silver spoon in their mouths; and the rake dies more quickly than the philosopher. Two of the most marked cases of ataxy which I ever saw, occurred, one in a member of the hereditary branch of the British Legislature, who, being of slight physique and calm and fastidious by temperament, surrounded himself with everything that may adorn life, and found consolation for his infirmity in the arts and litera-

ture. He lived to the age of sixty, after having been subject to the complaint for upwards of thirty years, and having hardly ever experienced really severe suffering. The other case was that of a hot-tempered Irishman, who, after having made a fortune in Australia, returned to England to spend his life in the wildest excitement, intrigues, and debauchery of every description. He died within four years from the outbreak of the malady, after having undergone the most frightful tortures which man may be called upon to endure, and after having seen an originally herculean constitution undermined and wasted in a comparatively short time.

The treatment of both diseases must be persevered in systematically for a considerable time if any real success is to be achieved. Rest is of great importance, and we must endeavour to arrange all conditions of life as favourably as possible for the patients. Of specifics we have two, viz., nitrate of silver and ergot of rye. Some great cures have been effected by the use of either of these medicines, more particularly in the earlier stages of the complaint; but, in the majority of cases, and at a later period, their effect is disappointing. Nitrate of silver should be given in doses of from $\frac{1}{8}$ to $\frac{1}{2}$ grain, and must be stopped after 120 grains have been given. The urine should be tested frequently and the remedy omitted if albuminuria be induced by it. Ergot is given either as Bonjean's ergotine, in doses from 1 to 5 grains, or as the liquid extract, in doses from 20 to 120 minims. I have completely cured two cases of ataxy with drachm doses of the latter preparation, three times a day; and at no period during its administration, which in one instance extended to six, and in another to eight months, were there any symptoms of ergotism. Damiana likewise appears to have a special influence on the cord in these cases; I give it in doses of 20 to 60 minims of the liquid extract. Iodide of potassium, strychnia, and arsenic are generally ineffective. The constant galvanic current is useful for the relief of pain, paralysis of the ocular muscles, anæsthesia, and vesical debility. If used sufficiently early, it appears capable of arresting the disease. It is, however, essential for success that a gentle and perfectly steady current should be used, by large electrodes, for a short time, and that all shocks, Voltaic alternatives, or powerful and prolonged applications be avoided. A judiciously directed hydrotherapeutical treatment, and the thermal brines of Rehme and Nauheim in Germany, and Droitwich in England, are also useful. For the relief of the pain of ataxy, I can strongly recommend the salicylate of soda, in twenty grain doses several times a day. It often acts better than the hypodermic injection of morphia or chloral, but is likewise, as all other remedies, occasionally disappointing. Special attention must be given to the state of the bladder and rectum. For catarrh of the bladder with ammoniacal decomposition of the urine, the salicylate of soda in the doses just mentioned is useful; while for constipation, the Hunyadi János water and allied remedies may be given. Where symptoms of general debility

and impaired nutrition are prominent, phosphorus and cod-liver oil, alone or in combination, have proved to me most valuable.

For lateral sclerosis, ergot and nitrate of silver likewise deserve a trial. For the relief of the muscular rigidity and twitches, the bromides of sodium, potassium, and ammonium may be given. I have sometimes usefully combined them with *extractum physostigmatis*, in doses from $\frac{1}{8}$ to $\frac{1}{2}$ grain, and *succus conii*. The motor debility is often successfully combated by galvanization of the cord and suffering nerves; and the use of sulphur baths at a temperature of 98° or even 100° may prove serviceable.

ARTICLE III.

THE MUSCLE OF ACCOMMODATION, AND ITS MODE OF ACTION. By M. J. DE ROSSET, M.D., of New York, Ophthalmic Surgeon to Dispensary Holy Trinity, Assistant Surgeon New York Eye and Ear Infirmary, etc. etc.

THE physiological rôle performed by the anatomical elements within the eye for the purpose of adapting vision to varying distances has never been satisfactorily explained; and the inherent difficulties which oppose an explanation have hitherto appeared so insuperable, that physiologists generally, and ophthalmologists, whom the matter more nearly concerns, have, in despair, been forced to a tacit assent to the Helmholtz theory as the least objectionable yet propounded.

The difficulties in solving this question issue not so much out of our ignorance of the anatomy of the structures involved (for this has been very perfectly demonstrated), as out of our failure to recognize that some of them cannot, for mechanical reasons, perform their rôle in the manner which the prevailing hypotheses demand. Whence this failure, it is impossible to say, unless it is from our having been fettered by the weight of authority and tradition; and it may seem almost madness to disturb the peaceful repose by engaging in a work that has for its purpose the overthrow of views upon which is founded so large a portion of what is held as sound in ophthalmic practice. Other difficulties encountered in the inquiry come from the uncertain state of our knowledge concerning the function and influence of the nerves which are known to be supplied to the ciliary muscle, and as long as we remain ignorant upon this important point, we should be very careful in inferences as to the bearing which physiological experiments on the nerves, and the disturbances caused by obscure pathological processes, have upon the question. Still another difficulty is in the notion, almost universally entertained, respecting the action of mydriatics and myotics. This notion, it is well known, has not been derived from actual observation, but is wholly assumed in a shape

to harmonize with the theories of accommodation; but so far from its being correct, the few direct observations which have been made of the movements of the ciliary muscle under the influence of a mydriatic (I refer to those of Hensen and Voelckers) indicate, with an approach to certainty, that this muscle contracts, is tetanized not paralyzed, when atropia is applied to it. The experiments of Coccius and others might also be cited in support of this view, but special allusion to them must be deferred to a later portion of this paper.

There are several facts so well established that they may be taken as the starting-point for this inquiry. I refer to, 1, the sufficiency of the varying degrees of convexity of the lens to account for all the focal changes in the dioptric system of the eye; 2, the inherent elasticity of the lens; 3, the common consent that the ciliary muscle is the only structure which actuates the lens.

The first of these propositions may be accepted absolutely as stated; but I would mention, if only in illustration of one of the many curious phases which this question has assumed, that Mr. Dudgeon, of England, has written a paper, in a serious vein, to show that the lens does not affect the accommodation by changing its convexity, but by rotating itself from without inwards. His explanation is probably as lucid as his idea will admit.

The second proposition, likewise, has few opponents; but some German physiologists who hold to the "*compressor lentis accommodatorius*" theory of Langenbeck, think that the lenticular elasticity restores a flatness to the lens when the alleged compressive action of the muscle is withdrawn.

The third proposition is sustained by the manifest significance in the location and relations of the ciliary muscle.

Starting from these facts, my own experiments and study lead me into a wide divergence from the commonly accepted view, and I hope to be able to show that the play of the ciliary muscle produces effects quite the reverse of those which are now ascribed to it.

Let us first review the histology and anatomy of this muscle, and consider carefully its contiguous relations, for these lie at the very root of the conclusions to be hereinafter expressed. We may then examine the muscle in action, analyzing the various objective and subjective phenomena associated with it, and inquire into the influence of atropia and eserine; and, lastly, whether the conditions which are now attributed to paralysis and spasm have been rightly interpreted, and whether there is anything in them, from an etiological point of view, to invalidate conclusions to which, it will be claimed, the anatomical facts irresistibly lead.

The fibres of this ciliary muscle resemble those of all smooth muscles in being pale and unstriped, and in the character of their nuclear elements. The resemblance also exists in their ordinary movements being associated

ones, rather than independent, and in their being peculiarly subject to reflex influences.

They lie chiefly in a meridional direction, forming a part of the choroidal tunic, their greater bulk being anterior to the equator; but some fasciculi are traceable backwards, quite up to the optic nerve entrance. Like in all smooth muscles, in addition to longitudinal fibres there are others which anastomose in a most plexiform network, their general direction being crosswise. In many eyes these are found as far posteriorly as the equator; but they usually exist in greater preponderance at the anterior part of the choroid, forming with the meridional fibres, as these converge, the bulky portion of the muscle known as the ciliary body and processes.

Upon meridional section of the muscle in its anterior portion, these anastomosing fibres present such an appearance as led Langenbeck and Müller to believe that they constituted an annular mass, which the imagination easily pictured was ready to actuate the lens by pressure upon its margin. If this had been sustained, the question of so-called active accommodation would have been completely solved; but later investigations have disproved its possibility, showing that the ciliary body not only does not touch the lens, but that the interval between it and the lens margin is not sensibly diminished, even under the most vigorous adjustment for near vision.

The general shape of this thickened part of the muscle is triangular, with the base looking forwards and towards the axis of the eye; and Iwanoff and others have attempted to show that variations in this triangle are characteristic of the several metropic states, and due to hypertrophy or atrophy induced by variations in the accommodative activities. Loring has shown that these triangles are probably in no way connected with the exercise of the accommodation, but exist as anatomical consequences of a longer or shorter optic axis. This may probably be accepted as a fact, but no explanation is given for it. It seems to me clear that these triangles, which embrace, or constitute, the ciliary body and processes, have a true geometric reason for their existence in varying shapes. *They exist of necessity*, because the meridional fibres, as they dip inward towards the anterior pole and axis, must become infolded and form prominent plaits, the progressively contracting zone not furnishing space enough for their expansion into a thin smooth layer, as nearer the equator. If the meridional fibres were continued in bulk backwards towards the posterior pole of the eye, we should have also in the vicinity of the fovea a mass of muscle similar to the ciliary body. I do not think that apart from its relation to the accommodation the ciliary body has any other purpose or function than to accommodate the rich vascular and nerve supply of that region, unless it be to furnish some support to the vitreous at a point which, if it were absent, would be very feeble. As to the variations in the triangular shape of the ciliary body, some explanation of them may

be had if we consider that the hypermetropic eye resembles an oblate sphere, and that in the sudden dip and flatness of the great circles, as they approach the pole, the fibres of the muscle must be infolded more suddenly, and in a shape characteristic of the triangle in eyes of this refraction; but the myopic eye is more prolate in its sphericity, and as the great circles dip more gradually towards the pole, so the muscle would be more gradually infolded, and have its reduplications extend meridionally over a greater length.

If the ciliary muscle be divided in a direction perpendicular to the meridians the anastomosing fibres will not be well displayed, but the nuclear elements of the longitudinal fibres become conspicuous; but if the division be made meridionally the longitudinal fibres will be shown in their length, and the nuclei of the anastomosing fibres will become visible, with sections of ovoid shape, varying according to the angle at which the incision crossed them.

The function of the anastomosing fibres is not an independent one: they contract consensually with the others, but do not influence the convexity of the lens. They serve only as a remora to bind the longitudinal bundles together, and thus render more uniform the pressure exerted by the muscle as a whole on the intraocular contents.

We have thus seen that the anastomosing fibres and the ciliary body and processes have no special relation to the lenticular changes, and in corroboration of this I may mention that the mass has often been completely divided for surgical purposes without materially affecting the power and range of the accommodation.

Let us return now to the longitudinal fibres. As has been said, these lie side by side, in a thin layer, in an antero-posterior direction, and form a part of the tunica choroidea. Posterior to the equator they are blended with the connective tissue of the choroid, but some fibres may be traced well backwards towards the macula. This connection is a very firm one, and so arranged that the muscle exerts no traction on the choriocapillaris and retina, as originally conceived by Brücke, and recently urged by Dr. Thomson, of Philadelphia, in an attempt to show that astigmatism may be produced by the independent contraction of fasciculi lying in different meridians. This connective tissue may be regarded as a true posterior tendon of the muscle, holding it in fixed relation with the ring around the optic nerve entrance. These straight fibres, as they pass forwards, divide near the anterior end of the muscle into two portions, or heads; the outer one, following the general contour of the globe, is firmly attached to the corneo-scleral line by the ligamentum pectinatum, while the inner one, which separates from the other a little in front of the ora serrata retinæ, dips inwards, with a smaller curve, and terminates in a thick, annular, triangular mass, the ciliary body, whose lumen is a little larger than the diameter of the lens which lies almost within its embrace.

This inner head is firmly attached to the zonula ciliaris, or Zinnii, which, in its turn, is intimately united by brush-like processes with the capsule of the lens. Thus we see the ciliary muscle forming, by means of its inner head and the zonule and lens in front, a complete inner envelope, or tunic, to the globe. The zonule bears such an important relation to this muscle that we must give it a brief notice.

It has deep-seated attachments, as far back as the æquator oculi, to the areolar net-work of the vitreous, and to the membrana limitans as far forward as the ora serrata. Anterior to that point it is free until it reaches the corpus ciliare, to which it is firmly attached, thence passing on to unite with the capsule of the lens.

Of the developmental history of the zonule, whether from the vitreous, corpus ciliare, or capsule, unfortunately little is known. It only exists late in the embryo after the vessels which develop the capsule have disappeared. It is, however, not of the nature of connective tissue, and, therefore, it is proper to infer, not of the same genetic origin as the trabeculæ of the vitreous. But for some radial fibres in it it might be said to be hyaline in structure, and it possesses, in spite of authors' assertions to the contrary, but little, if any, contractility. It must be regarded as somewhat unique in its histological character, and is charged with a unique function, which constitutes it at once a true tendon to the ciliary muscle.

Such is a concise and, so far as is essential to our object, I trust, a lucid statement of the anatomy of these parts, made in accordance with the latest and most trustworthy authorities, without an attempt to modify it, however slightly, into an adaptation to any physiological theory.

It must be now evident that the immediate effect produced by the contraction of these straight fibres is a tension exerted in an antero-posterior direction only. This tension is made practically between two points, the lin. supra-choroid. and the corneo-scleral line, and tends probably to approximate these points; but as pressure is simultaneously made upon the semifluid intra-ocular contents by these fibres and the anastomosing ones, an approximation is wholly prevented, and the two points do not change their relative distance; the muscle becomes tenser, but, as we shall see directly, what actual movement it makes is confined to its inner, or free, head. And this might be inferred *a priori*, since the only essential function of the muscle is to actuate the lens which is connected solely with this inner head. That the tension transmitted through the outer head (we may call it the *corneal* head, to distinguish it from the corpus ciliare, or *lenticular* head,) is not capable of shortening the polar diameter of the globe is rendered almost certain by further anatomical considerations. The ciliary muscle, as a part of one of the tunics of the eye, is closely applied to the inner surface of the sclerotic, but connected with it, if at all, only in the loosest manner. When the muscle contracts, its tendency is to separate from the sclerotic to form a chord, of which the sclero-

tic would be the arc. But actual separation of the two would be impossible unless the space remaining were instantly filled (for which, obviously, no provision is made), so the sclerotic follows, of necessity, the retreat of the muscle, by virtue of the counter-extension which the pressure upon the vitreous exerts upon the poles of the globe. The effect of this antero-posterior extension is to elongate slightly the vitreous body, and to press against the lens in front, but it cannot advance this, because a forward movement of the lens is restrained by the synchronous backward traction transmitted through the lenticular head of the muscle. It must be remembered that these actions and movements are extremely minute in quantity, to be expressed by mere fractions of a mm., as may be shown by imitating them with a loose, spherical, inelastic bag filled to the same manometric tension that the eye presents.

I may mention here, although not exactly in place, that I have made the mathematical calculations necessary to show the difference in diameter of the lens during the two maximum opposite states of adjustment, and I find that less than $\frac{1}{5}$ mm. change in diameter is sufficient to account for the extremes of alteration in convexity. Now, as this change is effected wholly by the alternate relaxation and tension of the ciliary muscle, the amount to be ascribed to each meridian of straight fibres is about $\frac{1}{10}$ mm., which represents the extent to which any observed point of the ciliary body would advance or recede in its extreme movements, a distance obviously too small to be noted by the means used by those observers who have engaged in the controversy respecting the movements of the ciliary body in accommodation. My own observations upon this point have been limited to two cases: one a large iridectomy, made for glaucoma, and one an aphakial eye, in which the iridectomy was rather larger than usual, and perfectly unobstructed by opacities of any kind. In the first case (an intelligent physician, aged 50, with $\frac{1}{2} = \frac{1}{1\frac{1}{2}}$), the observations were repeatedly and carefully made, the patient being trained to a complete and rapid transference of vision, to and fro from r to p , and upon no occasion could I observe the slightest alteration of the interval between the ciliary body and the lens margin, although the observations were made with a magnifier. Of course, at this age, the lens had lost a large portion of its plasticity, and the excursions of the ciliary body would be expected to be greater than those of the lenticular margin; nevertheless no appreciable diminution of the ciliar-lenticular interval could be detected. The observations were continued from time to time with atropia and eserine, but always with the same negative results.

The second case was a lady, aged 52, upon whom I had operated for extraction of the lens, making an unusually large iridectomy, extending well up to the attached periphery of the iris. The pupil was perfectly clear, and she had $V = \frac{2}{30}$. The experiments were conducted with and without atropia and eserine. The same negative conclusions were

reached as to the advance and recession of the ciliary body when observed, first, without any application, and then with eserine; but recession of the ciliary was noticeable when the effect of a strong solution of atropia (1 : 120) was watched from the moment of its instillation. If the lens had been present, and I had watched for this recession by measuring the ciliar-lenticular interval, I, perhaps, would not have detected it, as the lens margin always follows the movement of the muscle, and in the same degree. I am convinced that in cases of extraction the anterior visible head of this ciliary muscle always recedes a little, by slight structural shortening (of the myolemma), it having lost the counter-extension exerted by the resiliency of the lens substance; and this always takes place to the degree permitted by the posterior capsule in passing to a less concave or even to a plane or convex condition. Incidentally I may mention here that I have had an opportunity of examining an eye to discover the changes which followed a successful cataract extraction, the patient dying six years after the operation. The bulb was frozen with atomized rhigolene, and upon section it was found that the lenticular fossa had disappeared, and the capsule which here forms the limiting membrane of the vitreous had bulged forward, and become convex, in the same radial curve as the vitreous surface elsewhere presented. I did not know, at the time the observations were made (1875), that other ophthalmologists had *theoretically* anticipated the results of my dissection.

My observations with atropia correspond with those of Coccius, though my inferences differ from his.

It becomes apparent from this anatomical study that the ciliary muscle, *quoad* its outer or corneal head, cannot approximate its two points of attachment, and consequently it is impossible that its contractions should relax the zonule, and so give play to the elasticity of the lens. This is rendered evident by the general anatomical features of the muscle, and by the points of attachment of the zonule. In the lenticular head of the muscle the proportion of fibres is much greater than in the corneal head, and hence the actual amount of movement described by the lenticular head must be greater than that described by the other; and this movement can only be backwards, since all the fixed points lie in that direction. If any *posterior* part of the muscle were advanced, it could not relax the zonule, since this structure is only attached to the muscle along its lenticular head; and as the movement which this makes is backwards, it must render the zonule in front of it more tense, and thereby diminish the convexity of the lens. It seems to me that nothing can invalidate this conclusion, unless it be shown that there does exist a circular mass of fibres whose centric contraction diminishes its lumen. But we know that in high degrees of M such fibres are rare; in some eyes they are entirely absent; and are never found in any of the domestic animals except the pig, and in that one it exists only in the posterior part of the muscle. As accommodation takes

place in all of these without the intervention of circular fibres, why should they be invoked in any instance? The probable function of the anastomosing fibres has already been explained.

The two anterior heads of the muscle respond to the same nervous impulses, whether volitional or reflex, contracting or relaxing synchronously. The outer head holds the muscle firmly in contact with the sclerotic, and prevents the excessive dragging back of the muscle and associated structures, which would inevitably follow if there were not a fixed point at the corneo-scleral line. The inner head, which, it will now be seen, is the only essential agent in accommodation, actuates the lens through the medium of the zonule. If the outer head did in effect approximate slightly the two poles of the eye, and so relax the zonule, this relaxation would be more than neutralized by the greater backward movement described by the inner head. So that under no exigency of the hypothesis is it possible to conceive of the zonule being relaxed by contraction of the ciliary muscle. Besides, the anomaly of such an effect forbids its assumption, and would render the idea tenable only upon actual demonstration of its truth.

Let us now see what this exposition has led us to. Acknowledging the greater convexity of the lens in near vision, and its less convexity in remote vision, I hold that the elastic power of the lens is in *opposing* relation to the contractile power of the ciliary muscle, and that when there is complete muscular relaxation the lens is thickened, *ad maximum*, for the nearest possible adjustment, and, contrariwise, when the muscle is in its state of greatest possible contraction the elasticity is overcome, and the adjustment is for the remotest point. This implies that accommodation for a distance is an *active* product, while that for near points is *passive*, or due to resiliency only, a fact which I shall endeavour to sustain by further argument from the epi-phenomena, when we come to consider Donders' ground for believing the contrary. This view also, it may be said, implies that the eye is in a state of rest when accommodated for near vision, and active when adjusted for remote points—circumstances which the subjective phenomena may seem to invalidate. But when we come to analyze Donders' inferences from the subjective phenomena of near vision, I shall show that these are not referable to the ciliary muscle; and that the ciliary muscle, in addition to its homogeneous relations to the sphincter muscles, has many analogies with them, and like them, when uninfluenced by the will or reflex causes, is normally in a state of partial contraction, to be in reality taken as its state of rest. Thus we find, when the eyes are not actively and purposively employed, they are converged and accommodated for a point about eight feet distant, called the mesopter, which, *ipso facto*, must be their point of equilibrium or rest.

The ciliary muscle is a very feeble muscle, as may be inferred from its extreme tenuity, but what its dynamic power is I do not know, and can conceive of no means of measuring it, for the lens, upon its removal from

the body, loses its elasticity so speedily that it is impossible to estimate by experiment the equivalent in units of weight which the muscle must possess in order to overcome this elasticity. The muscle has, perhaps nothing else to do except to overcome the convexity of the lens, and perhaps to exercise pressure in relation to secretion and absorption. I am quite sure it is too feeble to have any effect upon the dense sclerotic coat, in the way of producing staphyloma, unless an unimportant predisposing one, as in myopes, in whom, according to this theory, the muscle, in order to maintain a comparative flatness of the lens (so as to neutralize the refractive error) is in an habitual state of greater or less contraction. Of the possible relation of this pressure to some forms of glaucoma, suggested by this study, I shall say a few words later. The active agents in the production of staphyloma are the periglobar muscles in the powerful pressure which they maintain upon the bulb in close convergence, particularly in cases of disturbed coördination when antagonistic muscles are simultaneously tense.

It will be noted, and perhaps with surprise, that this theory is just the reverse of the Helmholtz theory, as stated by Donders.¹ He holds that the zonule is *relaxed* when the ciliary muscle is contracted, but evidently wishing to avoid the absurdity which the converse would involve, he very ingeniously relegates the tension of the zonule to neighbouring elastic parts, a proposition hardly more tenable, because the zonule is attached to, and can be influenced by, no other neighbouring part except the lenticular head of the ciliary muscle.

In pursuance of the plan laid down early in the course of this paper, our next step must be to inquire into the information deducible from an analysis of the subjective phenomena observed in accommodation. These may be of two kinds: those experienced in near vision, and those in distant vision, although Donders, in giving his reasons for maintaining the Helmholtz theory, seems to ignore the latter entirely. I am quite sure that nothing conclusive is to be drawn from a consideration of subjective phenomena, and it is to be regretted that, in a work² so uniformly careful in its postulates, and logical in its deductions, so much stress should have been laid upon them.

The subjective phenomena (fatigue, strain, pain, etc.) associated with the act of vision at near points proceeds mainly, if not wholly, from the forcible contraction, and long pressure of the internal recti muscles, the sensations being equivalent in every respect to those which result from overtaxing, by powerful or long-sustained effort, any of the voluntary muscles of the body. A simple experiment suffices to demonstrate the truth of this proposition. If prisms of 4 or 5 degrees be held with bases inwards before a pair of emmetropic eyes, the individual, provided the so-called positive part of his relative range of accommodation is normal, will

¹ Accom. & Refract. New Syd. Soc. Trans, p. 20 *et seq.*

² Ibid.

be able to read, without any of the subjective phenomena of close vision, even when the print is held almost at his near point. This is because the eye-ball is relieved of the pressure ordinarily exerted upon it by the periglobular muscles in accommodation for that distance; and because the action of the ciliary muscle is insufficient, or, rather, not of a kind to produce the phenomena. But if we admit, for the moment, that a part of the subjective phenomena occurring in near vision is due to the fatigue of the ciliary muscle, what would we have left to explain the well-known sense of fatigue and strain which every one admits is associated with long gazing into *great distances*? Under these circumstances none of the periglobular muscles are in a state of contraction, none of them are pressing upon the globe; and, therefore, if we admit, as the Helmholtz theory alleges, that the ciliary muscle is also relaxed, nothing would remain to produce the subjective associations of distant vision. The *fatigue, etc., of close vision is not due to accommodation, but to convergence*; and I cannot fail to recognize that the *sensations accompanying distant vision, so unlike the others, are the outcome of the exercise of the feeble unstriated ciliary muscle*. And so we have the subjective phenomena of both states of accommodation fully explained, and thereby see that Donders' ground for maintaining the activity of so-called positive accommodation only is insufficient and erroneous. Moreover, Donders says¹ that "all voluntary movements require the intervention of muscular elements," but, in strange contradiction, denies any muscular element in the adjustment towards ∞ . Certainly he must regard this act of the accommodation as much an operation of the will as is the other!

Probably nothing has contributed a greater obstacle to a solution of the problem of accommodation than the erroneous views which have prevailed respecting the action of mydriatics and myotics, represented respectively by atropia and eserine. Physiologists have differed as to the influence of these agents upon the motor centres and upon muscular fibre, but the weight of authority, based upon experimental and clinical observations, is to-day largely in favour of the view which attributes to atropia a tetanizing effect upon the muscular system, and to eserine a paralyzing effect. Donders, it is true, considers it little less than absurd to suppose this, but it is evident that the Helmholtz theory has driven him to such a position.

Dr. H. C. Wood has shown² that atropia stimulates the frequency of the heart and increases the arterial tension. Harley and Meyron show³ that belladonna (atropia) stimulates the sympathetic, and that small doses induce contraction of the arteries—evidently tetanizing effects.

M. Lemattre and Wharton Jones⁴ asserted that atropia does not dilate the irides of pigeons, because there are no radial fibres; from which we

¹ Op. cit., p. 20.

² Am. Journ. Med. Sci., vol. lxx. p. 333.

³ Lancet, 1874, No. 1, p. 903.

⁴ Lancet, 1857, vol. i. p. 59.

may infer that when dilatation does take place it must be through a stimulating action on these fibres, and that a paralyzing effect upon the circular fibres is not of itself sufficient to enlarge the pupil. In reference to this anatomical peculiarity, however, Iwanoff and Rollett¹ demonstrate in a beautifully illustrated paper that it does not exist, but that pigeons do possess radiating fibres in their irides. So that nothing definite is to be deduced from the experiments upon these birds, except that, like rabbits, they are little susceptible to the influence of belladonna. The conclusions of these two last-named authors are confirmed by Max Schultze,² who is in turn corroborated by Johann Diegel.

Hensen and Voelckers, in experiments conducted in Kiel in 1868, laid bare the ciliary muscle by removing sections of the sclerotic in the ciliary region, when upon irritating (electrically) the nerves, and applying atropia to them, the muscle sunk and the choroid arched forwards. It is perfectly clear that this effect could have ensued only upon *contraction* of the muscle; for, as this springs into a tense state in the tendency to form the arc to the sclerotic chord (as described), it would withdraw slightly, and so arch the choroid.

In reference to the clinical observations of atropia, I need only allude briefly to its well-known action in increasing peristalsis; to its use in night-sweats; and to its tendency to induce dryness of the pharynx, and to diminish glandular action and bronchial secretion; to its marked power in giving tone to the sphincter vesicæ, in the incontinence of urine in children—all due to its tetanizing influence upon muscular fibre through the sympathetic.

In a word, whichever way we turn we fail to find primary paralysis of any muscle induced by atropia, and I would therefore ask, why should an exception be made as to the ciliary muscle? Unfortunately, facts have been here perverted to conform to theory, and probably have aided in the perpetuation of error. I admit that nothing absolute is shown with respect to the action of this muscle under atropia, because of the insuperable obstacles to successful experiments with it on the human eye; but from analogy we have the best reasons to infer that atropia causes it to contract, a fact that must invalidate the Helmholtz theory in its essence, and give additional probability to the theory which this paper has advanced upon anatomical grounds.

I must not forget to mention the experiments of Messrs. Tweedy, Ringer, and others with the *Duboisia Myoporoides*, a plant so closely resembling in its effects belladonna, that its active principle was at first supposed to be identical with atropia. It produces general tetanus; it tetanizes smooth muscles; it neutralizes the paralyzing effect of muscarine; and it

¹ Archiv für Ophthal., vol. xv. Abth. 1.

² Archiv für Mikros. Anat., vol. vi. Heft. 1, 1870.

affects the pupil and the accommodation precisely as does atropia. It has no paralyzing effects. What we say of it is, without doubt, applicable to its congener—atropia.

The physiological experiments with Calabar bean (eserine) are not very abundantly recorded. Hensen and Voelckers noticed that it caused decided advance of the ciliary processes, while atropia caused equally decided retraction. Of course the supporters of the old theory may see nothing conclusive in this; but to me, coupled as it is with the anatomical arrangement of the ciliary muscle, and with the conceded paralyzing effect of Calabar upon muscles generally, it becomes a most significant fact.

The efficacy of Calabar in tetanoid affections has been very conclusively pointed out by many writers in this country, and by Mr. Thorburn Patterson and others in England. In fact, it is so generally known that no further allusion need be made to it. There is no necessity for supposing that it acts upon the ciliary muscle in a way different from that which has been demonstrated for other muscles, and I have failed to find a single instance of its tetanizing effect. This is a difficulty which the Helmholtz theory cannot overcome, whereas the phenomena of Calabar present only harmonies with the theory here offered. I would allude also to the experiments of Galezowski with pilocarpine—a substance of which the paralyzing effect is well known. It affects the eye precisely as does eserine.

I will recall what the Helmholtz theory says of atropia and eserine: Atropia adjusts the vision for distant points, because it *paralyzes* the ciliary muscle, and eserine adjusts it for near vision because it *tetanizes* the same muscle: effects, it is to be noted, totally dissimilar to, and quite the reverse of, those which these agents are known to exert in every other part of the body, however analogous in its histological and physiological features to the ciliary muscle. On the contrary, the theory of this paper, in order to account for the physical phenomena which atropia and eserine elicit, requires them to exert the same effect upon the ciliary muscle that they exert elsewhere in the economy.

This inquiry might with confidence be allowed to rest here, but the strong claim to support which is made for the Helmholtz theory, upon grounds deduced from the phenomena of intra-cranial and nerve lesions, requires that we shall examine into the true inferences to be drawn from them. It cannot be denied that some cases of what are now called paralysis and spasm do apparently harmonize with the Helmholtz theory, but when we consider how complex neurological questions are, particularly where an uncertainty prevails as to both central and peripheric organs, as well as to the tracts of conduction of nerve impulses, and the modification which these undergo by anastomosis, and further ganglionic elaboration, it will be readily seen how liable any general conclusions from them are to be erroneous. Although we may have a mass of positive facts in favor of

a given proposition, yet if we discover a single fact equally positive which renders it improbable, the chances are that conclusions from the first will prove erroneous. Even experimental physiology, which is of such great consequence in enabling us to trace the relations of cause and effect, has contributed nothing absolutely definite respecting the motor nerves of the intra-ocular muscle; so that physiologists, in attempts to unravel this problem, have been obliged to reason from effect to cause—from phenomenon to lesion—a process which involves hypotheses at every step, and is little to be relied on to establish principles.

As yet little is known by demonstration of the nerve tract through which motor impulses come to the ciliary muscle, or of the central seat whence they originate, or of the modifications they undergo by association, or through special ganglionic influence. It is known that the third, fourth, and sixth nerves are motor tracts for the periglobar and other extra-ocular muscles; that these in their course communicate freely with other nerves, conspicuously the fifth and sympathetic, but for what purpose we are ignorant: whether it be for the interchange of their respective influences, or to establish co-ordinate associations, direct or inverse, or to provide for reflex conduction and responses, is almost wholly a matter of conjecture. Injuries within the cranium, whether of coarse disease, accidental, or purposive, for experimentation, do not by any means evolve uniform results, although they may be similarly located. Injury or disease of the Gasserian and lenticular ganglia give different results in different cases, probably from communication of the disease or injury to contiguous nerve fibres.

The third and fifth¹ nerve and the sympathetic may each contribute something towards the motor supply of the ciliary muscle, as each contributes branches to the ciliary ganglion; but if this ganglion be destroyed the pupil is neither markedly dilated nor contracted, and the accommodation is usually adjusted for ∞ , but not always. Whether these uncertain effects are referable to the sympathetic or to the third nerve element in the ganglion is not known. If the third nerve be divided posteriorly to the ciliary ganglion, usually paralysis of superior, inferior, and internal recti and inferior oblique follows, but not always. Sections of the sympathetic in the neck produce often an adjustment for near points, with myosis; and Reuling's case, reported in Knapp's *Archives for Ophthalm. and Otol.*, indicates that injury or disease in the cervical region may produce the same effect. Why the result is not uniform we cannot say, but it is possible that it may proceed from one or two circumstances: first, certain fibres of the sympathetic which influence the ciliary muscle may escape; for, according to Vulpian, all the sympathetic fibres do not pass through the first cervical ganglion, or through the portion of the trunk above that;

¹ I say fifth: see Hensen and Voelcker's experiments, Graefe Archiv., Bd. xxiv. Abth. 1.

and second, there may be anomalies in the course or distribution, producing unexpected effects, just as paralyses are often found on the same side as that upon which a cerebral injury has happened, and which are now believed to be due to anomalies in the course of the pyramidal fibres, which, instead of crossing to the posterior lateral columns of the spinal cord on the opposite side, continue directly into those of the same side.

Hensen and Voelcker's latest experiments¹ to determine which is the nerve of accommodation do not seem to yield any satisfactory information, and, as I see no promise of benefit in prolonging this paper into an analysis of them, I would simply express my conviction that they are very contradictory, and leave the question precisely where it stood before. For instance, irritation of the root of the oculo-motor nerve, and of the trunk of the nerve in the orbit, gave no results in several of the experiments; but experiments directly upon the ciliary ganglion and ciliary nerves, and even upon the fifth nerve, whether by section or irritation, produced profound effects. The nerve of accommodation therefore must be left for the present to hypothesis founded upon the anatomy of the ciliary muscle, and upon the observation of the effects of mydriatics and myotics. And I conceive that it is not of vital importance to the physiological problem that this question should be answered here. My own hypothesis in respect to this (upon which, however, I lay no stress) is, to the effect that the sympathetic nerve determines the contraction of the ciliary muscle, perhaps through fibres which come from the motor centre of accommodation. It conveys to the muscle the volitional impulse, as well as the reflex and co-ordinating stimulus which secures the correspondence it is known to have with other muscular movements. An excitation of the oculo-motor may determine an apparent paresis of the sympathetic; while a paralysis of the oculo-motor may give a dominant effect to the function of that nerve; and the converse of both these propositions may be true. So that what is now said to be *paralysis* of the ciliary muscle, and due to the pressure upon the third nerve, with impairment of its neurility, is interpreted by the terms of my theory to be a *spasm*, due to dominant effect of the sympathetic or some other nerve centre. It is not an uncommon thing to witness depression of one function accompanied by exaltation of another in some way correlated with it. And according to Brown-Séquard the disturbance of any portion of the brain, from causes centric or peripheric, may determine in other portions disturbances of a similar or opposite nature;—that is, that circumstances which induce paralysis of one nerve, may indirectly exalt the neurility of another. Therefore, if a pathological process paralyzes any one or more of the periglobar muscles, there may be a simultaneous spasm of the ciliary muscle. I shall not attempt to explain how this takes place, but only note the possibility.

¹ Graefe's Archiv, Bd. XXXIV. Abth. 1.

The cases of so-called spasmodic myopia (of idiopathic origin) are very rare. M. Charcot¹ cites one of a woman suffering with hemi-anæsthesia, myosis and myopia of 0.75 dioptries (although she was hypermetropic), which two latter conditions atropia only *momentarily* affected. The myosis and myopia were, of course, attributed to *spasm*. Our theory looks upon them as due to reflex paralysis (through impairment of neurility of certain fibres in the sympathetic), and this would bring them in consonance with the other symptom, hemi-anæsthesia, which no one denies is a paralysis.

Galezowski² has seen a case of acquired (so-called spasmodic) myopia from syphilis; this it seems to me, from the effect which syphilis generally has upon the accommodation, would locate the lesion out of the oculomotor tract, and indicate that the portion of the sympathetic influencing the accommodation was affected, *i. e.*, rendered paretic; for the third nerve was certainly not affected, if we may judge from the integrity of the extra-ocular muscles. I need scarcely remark that I regard this condition not as one of *spasm*, but as a *paralysis* of the ciliary muscle, from which the elasticity of the lens was allowed free play, producing the myopia; and, in effect, we find Nagel³ and others making use of hypodermic injections of strychnia with marked benefit in such cases; but they did not recognize that the condition was one of paralysis although so much benefited by strychnia. I am able to cite from my own records several cases bearing upon this point.

A young girl, aged 14, who had never menstruated, and possessed few signs of puberty, came with a widely dilated pupil. Had had headache, and a "white veil" over the left eye for 12 hours. The headache was confined chiefly to the supra-orbital branch of the left trigeminus. The accommodation was for ∞ , and $V = \frac{2}{60}$. Ophthalmoscopic and visual fields normal, and she had $M \frac{1}{60}$ as determined by the ophthalmoscope and test-types. Required convex $\frac{1}{16}$ to read at 12'', and concave $\frac{1}{60}$ for Sn. xx at 20'. One drop of a one per cent. solution of eserine (it had been prepared 3 months) produced complete myosis in 15 minutes. She then required concave $\frac{1}{24}$ for Sn. xxx at 20', and read at 8'' without glasses.

The effect of the eserine did not wholly pass away for 48 hours, and the morbid symptoms did not return. I am constrained to regard the case as one of reflex *spasm* of the ciliary muscle, from irritation of the fifth nerve. The Helmholtz theory would regard it as one of complete *paralysis*, but paralysis limited to a single muscle is almost unknown in healthy subjects, whereas reflex spasm is a common concomitant of pain and peripheral irritation. The speedy relief obtained from eserine also implies spasm.

I shall not attack the whole subject of paralysis and spasm. I admit that some of their phenomena are quite unintelligible upon any hypothesis, but chiefly so when it is known that the lesion is sufficiently extensive to

¹ Prog. Med. Jan. 19, 1878.

² *Idem*.

³ Klin. Monatsblat. 1871, p. 391.

render the factors which produce the phenomena both numerous and complicated. The paralysis of diphtheria, for instance, is wholly a mystery, and until that is solved we cannot know with certainty why mydriasis and adjustment for r should exist, although the hypothesis advanced, of a tetanizing effect or dominant influence of the sympathetic, would account for it, and it is not forbidden by any fact or physiological reason.

The range which this inquiry might take is very great, and cannot be followed to its limits. There are many aspects of it which might form special subjects for discussion. I must say, however, that the more thoroughly I consider it the more probable does this new theory appear, and nowhere yet have I encountered facts which seriously threaten to overturn the conclusions.

Before closing, in order to clear away the confusion which grows out of the use of expressions to denote conditions the reverse of what they have denoted in the past, I desire to consider briefly the relation of this new theory to hypermetropia and myopia.

First, as to latent hypermetropia, it is commonly held that the latency is due to a tonic spasm, whereas our theory holds it to be a quantitative relaxation of the ciliary muscle. It must be remembered that only that portion of the entire range of the muscular play sufficient to neutralize the error of refraction is affected, the remaining portion of the range being unimpaired. But spasm rarely involves a muscle in that way, impairing a part of its range, and leaving the remainder unimpaired. Its effect is to limit action, and to induce unsteady and more violent contraction throughout the whole range. If it were spasm, *i. e.*, a tonic exercise of the muscular irritability, we should not be able, as we often are, to remove it by suitable convex lenses and prisms.

Moreover, if this vital contraction of the sarcois elements of a muscle should become permanent (as is alleged in H1), by a well recognized histological law we should have a wasting of them, and an increase in the myolemma, or elastic element, which we know does not as a rule occur in H. It is only active intermitting exercise of muscular fibrillæ that leads to their hypertrophy (as in the oft-cited case of the blacksmith's arm).

The ciliary muscle is correlated in its movements with the internal and external recti muscles—*inversely* with the internal rectus, and *directly* in a limited way with the external. When these coördinations are disturbed, as they are in hypermetropia, there will follow fatigue (asthenopic symptoms), because the two opposing recti muscles are brought into play simultaneously to make the convergence conform to the accommodation. This forcible action compresses the globe, which, with the sustained tension of the two muscles, is quite sufficient to account for the asthenopia without charging the comparatively relaxed ciliary muscle with any of it.

No form of asthenopia is more immediately produced than that which accompanies the act of looking strongly upwards, even with accommoda-

tion for distance; and the same may be said of looking strongly downwards. In both of these acts several muscles are implicated, and their location is such as to compress the globe when they thus contract synchronously.

It will also be found, after the ciliary muscle has been thoroughly atropinized, that a prolonged attempt at reading, say at 6 or 8 inches, even with suitable convex lenses, will entail asthenopic symptoms, obviously due only to pressure, and antagonism of external rectus. If the asthenopia of hyperopes proceeded from a forcible tension of the ciliary muscle, the use of atropia would likewise produce those symptoms, which, however, it does not.

I would call attention before closing to the very common effect of atropia, when vigorously applied, of changing the refraction so as to imply that an Hl had existed even as high as 1 dioptric, in eyes which every other test had shown to be emmetropic. So common, indeed, is this, that many ophthalmologists have supposed an Hl in every eye.

As all hypermetropia is the result of a short optic axis, of course this suspected latency is said to proceed from a supposed remnant of tension in the ciliary muscle; which until removed by atropia prevents the lens from attaining its maximum thinness. The true explanation of this apparent Hl is that after full adjustment for r , the instillation of strong atropia tetanizes, and still further shortens the ciliary muscle, and so, by the traction exerted through the zonule, renders the lens yet thinner. I have frequently noted this effect not only in emmetropic but also in myopic eyes; for instance, a myopia of $\frac{1}{20}$ has been reduced by the vigorous use of atropia to $\frac{1}{24}$ and even $\frac{1}{30}$. The effect is best shown in young subjects. This fact is an enigma to the Helmholtz theory.

There seems little reason to doubt that atropia causes an increased tension within the eye, and if so no more satisfactory explanation can be given of it than is offered by this view of its tetanizing effect upon the ciliary muscle; and, indeed, it is uncertain that its alleged action in dilating the small vessels (which, by the way, cannot be made out with the ophthalmoscope) would or could elevate the tension. It is true that some observers, notably Adamük and Grundhagen, hold that atropia diminishes the intra-ocular pressure, but v. Graefe, Wharton Jones, and Hart state that this is an error, and that the pressure is decidedly increased by it. Panas has endeavoured to reconcile the differences by stating that the changes in tension depend upon the pathological state. But our means for registering the tension are very crude, and are not trustworthy. Certain it is, latterly it has been shown that the use of atropia tends to aggravate the pain arising from the increased tension of glaucomatous states.

It seems to me that this view of the action of atropia furnishes a contribution to the very interesting inquiry into the etiology of glaucoma and increased tension, which has occupied so much attention during the past

year. I think there is a uniform assent to the proposition that both glaucoma and increased tension are due to derangements of the drainage system of the eye, and particularly to obstruction of the canal of Fontana, but no satisfactory explanation has been offered of the cause of the primary disturbances.

Mr. Brailey, Curator of the Royal London Ophthalmic Hospital, has made¹ valuable contributions to the subject of increased tension. He found changes in the ciliary body, of a nature not definitely described. In forty-nine cases there was atrophy of the ciliary body, and in many cases there were no circular fibres at all.

Of course the state of refraction was not known in these cases, nor could the degeneration of the ciliary body (if it were not a normal condition) be followed step by step, so as to throw some light on the progressive intra-ocular changes in glaucoma.

Dr. Loring has also made dissections of the ciliary muscle, and reports that he found the muscular tissue greatly atrophied in high degrees of myopia. He, of course, would hold this condition to be one of atrophy from disuse. It must be remembered that in myopia there is always a relative deficiency in the amount of muscle in the ciliary region, for geometric reasons, as has been shown. Now it cannot be questioned that a muscle tends to atrophy from disuse, but it can scarcely be alleged that in any degree of myopia there exists such an habitual disuse of the muscle as would lead to excessive wasting; for even in the higher expressions the eye is (at least at the present day) armed with a correcting glass which of necessity entails accommodative efforts.

Moreover, I have stated that in myopia the ciliary muscle is in a constant state of greater or less tension, and this very condition, in typical cases, is sufficient to give rise to the atrophy which is found. Every muscle is composed of two histological elements—the fibrillæ, or sarcous element, which possesses vital contractility; and the connective tissue, or myolemma, which is also contractile, but only physically so. A long-continued vital tension of a muscle tends to a waste of its sarcous element, and to increase of the myolemma, and thus is furnished one form of atrophy. The myolemma itself is able to keep up the tension by virtue of its physical elasticity, and the muscle undergoes structural shortening, sometimes without a serious loss of fibrillæ.

The question naturally presents itself, as to whether this constant contraction of the ciliary muscle in myopia has any relation to forms of amblyopia and to increased tension. Can it, by obstructing the return of venous blood, tend to disturb the equilibrium between secretion and absorption? Can it account for the common venous pulse of myopia? These questions are very suggestive, but are obviously beyond the scope of this

¹ R. L. O. H. Reports, vol. ix. p. 11, 1877.

paper. When careful observation discloses the causal relations of the different metropic states to glaucoma (if any exist), we shall be able to enlarge the field of our inquiry into the physiology of accommodation.

46 WEST THIRTY-SIXTH STREET, July, 1878.

ARTICLE IV.

ACTION OF PHOSPHORUS, ALKALIES, AND OF QUINIA ON THE GLOBULAR RICHNESS OF THE BLOOD. By ELBRIDGE G. CUTLER, M.D., and EDWARD H. BRADFORD, M.D., of Boston.

THE following few observations in a field of investigation which has hardly been worked upon may be of interest, supplementing the facts published in *The American Journal of the Medical Sciences* for Jan. 1878.

Action of Phosphorus on Healthy Subjects.—This drug is recommended by Dr. Brunton¹ as useful in pernicious anæmia. It has been used also in leucocythæmia. The following figures show its effect, in the healthy subject, upon the globular richness of the blood.

The number of globules in blood taken from the finger was

Red corpuscles . . .	3,311,984
White corpuscles . . .	4,737
Ratio of white to red . . .	1 to 690

Phosphorus .001 gramme was given three times a day, and increased gradually to .006 gramme. This caused diarrhœa and vomiting. The medicine was omitted for three days, and again taken in dose of .001 gramme ter die. Twenty-five days after the medicine was first taken, the count showed

Red corpuscles . . .	2,789,240
White corpuscles . . .	6,431
Ratio	1 to 433

A marked *decrease* in the red and an *increase* in the white was noticed. The drug was not well borne, and caused gastric disturbance even when taken in the smaller doses. This was also the case when the drug was administered to a case of pernicious anæmia. The gastric disturbance caused by .001 gramme phosphorus given three times a day (in the form of sugar-coated pill) necessitated in four or five days the discontinuance of the medicine. There was no improvement in the general symptoms. There was an increase in the globular richness after the medicine had been given four days, but as diarrhœa was caused by the phosphorus the increase in the globular richness could not be considered anything more than a physiological change.

In a case of leucocythæmia the drug caused gastric disturbance and diarrhœa. There was a slight increase in the globular richness during the exhibition of the phosphorus which was probably due to the diarrhœa.

¹ Practitioner, 1875.

To return to the case of the healthy subject who took phosphorus, several weeks after discontinuing the drug the globular richness was

Red corpuscles	. . .	3,249,600
White corpuscles	. . .	5,754
Ratio	. . .	1 to 564

Action of Alkalies on Healthy Subjects.—M. Pupier¹ reported the following experiment as a proof that the number of red corpuscles increases under the action of alkalies.

A dog was given 87 grms. of bicarbonate of soda daily (as Vichy water); there was no loss of weight.

The red corpuscles rose from	. . .	4,239,000
	to	5,910,000
and fell after stopping the alkali in twenty days to		4,480,000

A repetition of the experiment gave a similar result. M. Pupier was led to this investigation by the fact that the red corpuscles in a man who had taken for a fortnight 16–20 grms. of bicarbonate of soda a day amounted

to 5,406,000

That alkalies increase the number of red corpuscles is contrary to the opinion generally received.

The blood from the finger of a healthy male adult showed the

Red corpuscles to be	. . .	3,804,700
White corpuscles to be	. . .	4,062
Ratio	. . .	1 to 937

Bicarbonate of soda 4 grammes three times a day was taken daily, and in eight days the count showed

Red corpuscles	. . .	3,344,380
White corpuscles	. . .	3,713
Ratio	. . .	1 to 903

Bicarbonate of potash was substituted for soda, and one week later the

Red corpuscles were	. . .	3,561,020
White corpuscles were	. . .	3,385
Ratio	. . .	1 to 1,050

Bicarbonate of soda again used. One month later an examination of the blood showed the

Red corpuscles to be	. . .	3,555,604
White corpuscles to be	. . .	6,973
Ratio	. . .	1 to 515

The alkali was discontinued. One week later it was found that the

Red corpuscles were	. . .	3,696,400
White corpuscles were	. . .	4,365
Ratio	. . .	1 to 869

There had been some slight dyspeptic symptoms while the drug was taken.

There was therefore a slight *decrease* of the red corpuscles, and a slight *increase* of the white.

In a second case the result was the same; the figures, however, were mislaid.

Action of Quinia on Healthy Subjects.—Bulgak² reports that a contraction of the spleen could be brought about by injections of quinia into

¹ Acad. des Sciences Comptes Rendus, lxxx. p. 1148, 1149.

² Quoted in the Dublin Journ. of Med. Sci., Oct. 1876.

the veins, causing also an increase in the number of the white corpuscles in the splenic vein. Ergot had no effect.

We noticed the following variation in the globular richness during the administration of quinia.

Globular richness of a healthy male adult at 2 P. M., half an hour after a slight lunch.

Red corpuscles	.	.	.	3,249,600
White corpuscles	.	.	.	5,754
Ratio	.	.	.	1 to 566

The next day at 10 A. M. .97 gramme quiniæ sulph. was given, causing, from 1 to 3 P. M., a slight effect upon the nervous system. Half an hour after a lunch (the same as on the previous day) at 2 P. M. the count was

White corpuscles	.	.	.	8,300
Red	"	.	.	—

The red corpuscles were not increased, the exact figures, however, were mislaid.

On the next day 1.29 grammes quiniæ sulph. were given at 10 A. M., and at 2 P. M. the effects of the drug, tinnitus aurium, slight giddiness, some nervous excitement, were quite marked. An examination showed the

Red corpuscles to be	.	.	2,978,600
White corpuscles to be	.	.	12,186
Ratio	.	.	1 to 245

On the next day no quinia was taken; lunch at the same time; at 2 P. M. the

Red corpuscles numbered	.	3,422,902
White corpuscles numbered	.	5,575
Ratio	.	1 to 613

The habit of life during these four days was exactly the same; the lunch was exactly the same.

We have made no special investigations of the effect of quinia given in diseased conditions. In one case of syphilis which we observed there was a marked increase in the red corpuscles, 1,043,130 under the administration of cinchonæ sulph.

There was therefore in health a slight *diminution* in the number of red corpuscles, and a marked *increase* in the number of the white after the administration of a large dose of quiniæ sulph.

ARTICLE V.

PAROTIDITIS, OR MUMPS; A THEORY OF ITS ETIOLOGY, AND THE RATIONALE OF THE SECONDARY MANIFESTATIONS, OR SO-CALLED METASTASES. By A. B. ISHAM, M.D., Professor of Physiology in the Cincinnati College of Medicine and Surgery.

PAROTIDITIS, or mumps, is a disease which primarily affects the parotid gland, usually first upon one side, and in a day or two extending to the other. Both glands, however, not uncommonly become involved at the same time; or, more rarely, one gland only may be attacked, the other remaining unaffected until another disease visitation. Consecutively, the

submaxillary and sublingual glands are very often implicated. It is a disease which, as a rule, occurs but once in the same individual. The exceptions to the rule, when both glands have been the seat of the disease, are very rare.

As regards etiology, nothing has been developed since the days of Hippocrates. It appears in all seasons, but is most prevalent in fall and winter. It occurs in mountain districts, table lands, valleys, lowlands, islands, and upon ship-board. It is not confined within degrees of latitude and longitude. It prevails as an epidemic, or rather as an endemic, and sporadic cases are met with. The latter fact tends to negative any agency in causation of atmospheric and telluric influences.

Its well-known outbreak among new recruits in camps, among the inmates of boarding-schools and institutions, when no cases have been known to exist in the immediate neighbourhood, would point to the food as an etiological element. In the case of recruits, at their homes they were accustomed to soft food, which they "bolted" with but little mastication, and consequently little stimulation of the salivary gland secretion. Furnished with the army biscuit, or "hard tack," however, all the masticatory strength is called forth. This mechanical stimulus of jaw movement is supplemented by that of the dryness of the cracker. The secretion excited must be much more than that excited by a dry bread-crust, which has been found by Tuzek to be equal to the bulk of the crust. The secreting gland-cells, under this excessive and unusual secretion, become distended, and finally they are separated from the basement membrane, filling up the tube, and causing salivary retention. In consequence of the gland no longer equalizing pressure in the bloodvessels by removing fluid, effusion takes place into the connective tissues or lymph spaces, and the gland swells. This simple process may or may not be accompanied by inflammation. Analogous changes occur in the kidney tubules, consequent upon great blood-pressure from any cause.

The fact that both parotids are very often not affected simultaneously is not opposed to this view. In truth, it affords an easier explanation than the contagious catarrhal theory of causation. It is well known that in many persons mastication is principally one-sided. Physiologists have also shown that the secretion of saliva occurs upon the side of mastication. Where the two glands have been stimulated unequally by one-sided mastication, the one which has furnished the bulk of the secretion is first involved, the ducts being filled up by cast-off epithelial cells, and compressed by the pressure of effusion. The other gland then assumes the secretory function for both, but from having been functionally inactive, and from the burden of work so suddenly put upon it, proves unequal to the office. The same alterations now transpire as in the other gland, obstruction, effusion, and enlargement, with perhaps inflammation. The advocates of the catarrhal hypothesis put in the plea of "extension of the

irritation." Which is the more rational explanation? Where both sides have been equally operated upon by secretory stimuli they are attacked at the same time.

It is admitted that this idea of etiology receives its strongest support in its application to endemics in camps and institutions where the same diet obtains for all. Yet those endemics occurring in communities of individual families, and the sporadic cases presenting everywhere, while seemingly in opposition, are not without the range of such causation. While the separate families of a community live and cook differently, they are still dependent upon the same sources of food supply, and the substantial articles of nutriment are the same for all. Food varies in its constitution according to season, care, culture, etc.; the more solid matter it contains the greater the quantity of salivary fluid needed to moisten and act upon it. The source and quantity being the same, it is evident that it must act about the same in each family of the community, although modified in some by the mode of preparation. Here most of those not protected by a previous experience will be affected, but others obnoxious to the trouble may escape by reason of special diet, manner of food preparation, or from constitutional states having a bearing upon the quantity of food ingested. Sporadic cases may occur through causes pertaining to the individual, such as habits of chewing wax, dry wood, rubber, tobacco, etc., eruption of the teeth, or other processes acting as a stimulus to the salivary secretion. These etiological elements also belong to endemic visitation. Or they may be induced by individual peculiarities, certain articles of food affecting solitary individuals while they are inoperative upon the mass.

But this view must fail of acceptance if it is not competent to furnish a solution to the problem of non-recurrence, or why the affection never, or very seldom, recurs in the same individual. Without this it stands equal with the contagious catarrhal theory; but this is not enough. There is a physiological law that the development of an organ must be proportionate to the amount of work it has to perform. An attack of specific parotiditis indicates that the gland involved has not attained to the fulfilment of this law, and the completion of development is at once begun. New vesicles and lobules branch out, new epithelium cells are formed. Under the influence of this formative force, effusions and waste products are disposed of, and the gland reaches its acme of development, and is equal to any amount of work it may in the future be called upon to perform.

Favouring the representation that the process is one of development is the fact that cases of mumps are most common about the period of puberty when such developmental alterations ensue in other organs. The analogous changes are those taking place in the testicles, ovaries, and mammae. In the latter innumerable ramifications branch off from the ducts and some vesicles are formed. In the testicle the seminiferous tubes increase in size

and the seminal cells or vesicles are developed. In the ovaries the follicles and ova become enlarged.

Instances of very early ovulation and mammary development are not by any means wanting, as every one knows. Is it, therefore, astonishing that the affection known as mumps, which marks the full development of the salivary glands, should occur more frequently than the mentioned changes in the organs above named, between the age of two years and puberty, when we consider the thousand times greater exercise and stimulation to which they are subjected?

The disturbance therefore should take place more often about the period of puberty, because this is the time when general changes are proceeding in the organism. It is then that the system is most sensitive to extraneous influences and the salivary glands not less than other portions. That the parotid affection may not rarely be delayed for years beyond this time does not seriously militate against the proposition. The retardation of development in the mammae and ovaries consequent upon morbid states as phthisis, epilepsy, scrofula, etc., is familiar. Such instances serve to illustrate the fact that processes may manifest a selection for parts or organs of the body, and through their operation there interfere with actions in other parts or organs. Thus the alterations in the generative organs and apparatus of lactation, consequent upon the advent of puberty, may be so active as to consume all the formative force in the organism, and the salivary glands will remain as before. The longer after puberty, however, the change is delayed the more marked is likely to be its reaction upon the system, because, after this time the body elements tend to become more and more fixed. It is this which gives significance to the popular expression, "the mumps go hard with grown people."

We come now to consider the so-called metastatic phenomena of the affection. Where these occur it is usually five to eight days after the commencement of the parotid trouble. In the matter of frequency as gathered from writers, parts become involved in about the following order: testes, mammae, ovaries, labia majora, lymph glands, spleen, and brain. Leichtenstern (*Handb. d. Kind. Krankh.*) mentions nephritis and catarrh of the bladder, urethra, and vagina as rare occurrences. Dr. Dunn (*North of Eng. Med. and Surg. Journ.*, and *Amer. Journ. Med. Sci.*, 1831) reports four cases of mumps with inflammation of vagina and purulent discharge following. While it is asserted by some systemic writers that transference of the disease process to the ovaries never transpires, others place it next in frequency after affection of the mammae. The literature of the subject is exceedingly scanty. No citation of cases is given in works, and we have only found three cases reported in the journals, two by Damorest, and one by Meyner (*Clinic*, Oct. 1876). On the other hand, while in all the treatises involvement of the mammae in females is placed next in order of frequency to the testicles in the male, no references are given. After examination of

a wide range of journals, English and German, we have not been fortunate enough to find a single case recorded where these organs were implicated. Can it be possible that the authority of the traditional "old woman" was first accepted for this complication without credit, and so has been seized upon by one author after another? Rilliet, who has given us the most complete description of parotiditis extant, did not observe a single case of enlargement of the mammæ, and other writers specifically state that they have never met with it. We, therefore, believe that the ovaries are more frequently affected from parotiditis in females than other organs in this sex, but from the well-known obscurity of the symptoms, or from the modesty of these persons, it is not detected. Irritation of the stomach and intestinal tract is not specifically noticed, but that it occurs, the symptoms of anorexia, nausea, fever, and diarrhœa in many instances abundantly exhibit.

No example has been recorded as far as our investigation has been carried in which parotiditis had a relation to endocarditis, and the opportunity of supplying this hiatus is embraced by offering the following from our note-book.

Carrie M., æt. 4 years, brought to office Aug. 2, 1873, complains of lassitude; feverish in the afternoon and evening; no appetite; tongue slightly coated; bowels regular. Suitable medication prescribed. 3d. Condition about the same. 4th. Missed her fever and she was seen no more until the 7th when I was called in on account of a swelling in the right parotid region. The parotid of that side was regularly enlarged and firm. No congestion of pharynx and fauces. There was no fever. On the 8th both parotid regions were swollen and she had fever. The urine was high coloured, and upon examination was found to contain blood disks, tube casts, and to be albuminous. On the 9th her mother assumed the responsibility of taking her a walk through Eden Park. Called to her in the night. There was violent fever, delirium, dyspnœa, excited action of the heart, visible heaving impulse, and a murmur having the characters both of a blowing and a friction murmur, double with reference to the sounds but most plainly systolic as nearly as could be distinguished under the very rapid action. There was also discovered some amount of ascites. These morbid appearances all disappeared under treatment and time, good recovery ensuing.

It thus appears that any organ of the body except the liver and lungs, may become the seat of what has been termed a metastasis in mumps. Why these organs apparently are exempt, others nearly so, and yet others specially selected to share in the morbid expression it will be the endeavour to elucidate. In doing so it will be first necessary to inquire what influence the parotid secretion retained in the blood might exert upon the system. At the very commencement it must be confessed that nothing is really known respecting the vital chemistry of the salivary secretion further than that it forms from the blood ptyalin, a ferment which induces a saccharine conversion of starch, together with sulpho-cyanide of potassium, and the sodium and potassium chlorides and phosphates. It is to be held as an excretory product of the nutritive fluid, for, although it is reabsorbed,

yet, from contact with food and digestive juices its principles have undergone such metabolism that they are wholly changed. Being thus entitled to esteem it as an excretion it may be assumed to bear a comparison with other excretions, the retention of which in the circulating fluid we have definite information concerning. Taking the quantity secreted daily by an average adult man, which is calculated at about three pints, it has an important place among the excrementitious fluids.

Classing the *peculiar* salivary constituents, then, as matters to be separated from the blood, it follows that their retention in the blood or their entrance into it as salivary principles would be productive of mischief. When the urinary excretion is arrested, there are present the morbid appearances designated as uræmia. When the biliary flow is impeded, the condition recognized as cholesteræmia or jaundice ensues.

But before proceeding further it may be as well to establish that salivary retention occurs. Bouchet declares that parotiditis is simply salivary retention due to catarrhal inflammation of the excretory duct of the parotid gland. Virchow holds it to be an inflammation of the gland ducts with salivary retention and œdema of the interstitial tissue. These are about the only emphatic utterances met with. That an inflammatory condition of the duct or of the gland may set up is no wise opposed to the etiology and pathology advocated in this paper.

The question immediately arises, if salivary retention may prove so hurtful why is it that every case of mumps is not accompanied by more serious disturbances? This inquiry may be satisfied by a reference to the fact that the submaxillary gland secretion although more viscid contains the same principles as that of the parotid, and that under disability of the latter, the former, together with the sublingual, may perform its depurative function. Of some interest here are the results of the experimentation of Heidenhain upon dogs. He found that galvanic stimulation of the chorda tympani produced a watery secretion, and that under long-continued excitation of the sympathetic, the submaxillary secretion acquired the watery consistence of the parotid fluid. When, however, the submaxillary and sublingual glands become involved in addition to the parotids, we have absolute retention, with entrance into the blood of the salivary principles. Then marked evidences of systemic infection should be expected and they do occur; these are the so-called metastases.

The meaning conveyed by the term *metastases* is that there is a sudden shifting of the process from one point to another with complete removal of morbid action from the original seat. The majority of writers assert that they have never observed a sudden resolution in one part coincidently with a spread to another, and they believe that it occurs very exceptionally or not at all. They have only noticed the same gradual subsidence in the parotid, under such circumstances, as usually occurs without complication, in six to ten days from commencement of swelling. The metastatic phe-

nomena also gradually disappear in a like period of time. Since the *materies morbi* are retained excretory products in the blood, as herein set forth, these principles are carried in the blood stream to all organs of the body and they may, at any time, create a disturbance in any part without a transposition of all the disease appearances to this locality. There is really no metastasis, as we interpret this term, the outbreak in a part remote from the original seat simply being an expression of a systemic poison. The involvement of a new organ, as the testicle, may occur just at the subsidence of the parotid swelling as well as at any other time, and this is likely what has given rise to the idea of metastasis or sudden transference.

We are now brought to the task of showing why parotiditis is not more frequently attended with complications, why some organs do not become implicated at all, and others are specially obnoxious to the action of the morbid material.

The lungs owe their exemption to the office which they perform in blood depuration. Sugar, a substance which when present in quantity in blood occasions the fatal disease diabetes, is destroyed by passage through the lungs. Sulphuretted hydrogen when present in the air, even in minute quantities, is fatal to birds; but when it is injected into the blood, it is at once eliminated by the lungs, and no harm ensues. Not only are the pulmonary structures protected by this depurative function of the respiratory apparatus, but it exerts a protective influence also over all other parts of the body. Where the noxious matter is not too great, it may all be eliminated by the lungs in connection with the liver, kidneys, skin, and alimentary tract and complications be prevented.

The liver also is indebted for its freedom from disturbance to the same property it possesses of separating deleterious substances from the blood. Schiff has recently demonstrated by experiment that a dose of nicotin sufficiently large to kill a large dog, if injected into the general circulation, only produced feeble symptoms of poisoning when injected into the mesenteric veins and small intestines of other dogs. A double dose, passed through the liver before entering the general circulation, did not kill a dog. On the other hand, an injection five times diluted killed an animal in which the portal vein was tied. Cholesterine, too, a poisonous product, is removed by the liver. It is evident that this function of the liver exercises a general protective influence as already sufficiently mentioned in connection with the lungs.

The comparative rarity of kidney disturbance is also due to a similar action in blood purification. Dr. Letheby has shown that poisonous doses of arsenic may be repeatedly given to animals without injury, if a diuretic is administered at the same time. It is also the constant office of the kidneys to carry off urea, which, if retained, causes uræmic poisoning with its dangers. That these organs, however, should sometimes become the thea-

tre of the morbid action, is not strange, from the constantly increasing blood pressure they must sustain under the work put upon them in disposing of the poison. Here the pathological incident is that known as acute catarrhal nephritis, an example of which has been given in the detailed case already here reported. The secreting cells are washed off, the tubules blocked up, and inflammatory changes ensue as may also take place in the parotid.

The testicles and ovaries, the organs most often selected in the secondary manifestations, present anatomical peculiarities which are possessed by no other organs in the body, save the liver and kidneys. They are furnished with a double set of capillary plexuses. It is plain that the greater the amount of vascular area of an organ, the greater is its liability to become impressed by a blood poison circulating through it. In the liver and kidneys this extra liability is amply offset by their previously noticed eliminatory action upon noxious products. Another anatomical condition bearing upon the selection of the testicles and ovaries is that they are located at the lowest portion of the body where gravity or anything opposing a hindrance to the onward flow of the blood current must operate upon them to the fullest extent. An erethism of these organs which exists in certain persons also predisposes to their involvement. Thus of twelve cases occurring in sailors on ship-board reported by Dr. Lynch (*Braithwaite's Retros.*, 1856-7, ii. 26), the testicles were affected in ten and the brain in two. It is sufficient to call attention to the increased excitability of the sexual organs in sailors, or the generality of men pent up or confined anywhere, to account for the preference manifested in these cases. It is also well attested by many observers that implication of the testicles is not nearly so common in children.

Why the right testicle should be selected in preference to the left, as noticed by Rilliet, we are not prepared to explain. This observer noticed that out of 23 cases the right side was affected 13 times, the left 6 times, and in 4 both testes suffered together. We would suppose the contrary to obtain, since upon the left side varicocele is twice as common as upon the right, due, as first pointed out by Brinton in this Journal, to the right spermatic vein being supplied with a valve at its outlet, while the left has none.

Ressiguer (*Gaz. Méd.*, 1850; *Med.-Chir. Rev.*, Oct. 1850) mentions a case under his observation where there was orchitis without parotiditis, but which subsequently developed. He also cites a similar case by Groffier. In reference to these cases it may be said that while parotid enlargement had not appeared, yet there was obstruction and interference with the secretion and systemic infection as shown by the affection of the testes.

The lymphatics are absorbents, and no time need be occupied in enlarging upon how readily the lymph glands are acted upon by matters taken to them by the lymphatics under systemic infection. The spleen, too,

which is designated as a blood gland, must not rarely be disturbed by any impurity of the common nutritive fluid. How dependent the brain in the exercise of its functions is upon a pure circulating juice the most limited experience must appreciate. The cells of the gray matter cannot properly functionate upon depraved blood, and we may have all forms of disordered cerebral phenomena under such circumstances.

The mammary glands have been reserved to the last, and purposely. From what has been found written upon the subject we feel satisfied that secondary disturbances in these organs are among the rarest appearances of the disease. These glands are exposed not more or less to the morbid influence than other organs, which are among the least affected.

A word in regard to hypertrophies of the testicles and mammae, which are mentioned as very rare sequelæ. It is of course a matter of not difficult demonstration that from pressure and distension of effusion, or from inflammatory changes, the special vital activity of a part becomes lost, and it hypertrophies, because the energy which was stored up in its structure has gone out of it.

Finally is reached the action of reputed remedies. How do they accord with the views herein advanced? Dr. Czernické reports (*Gaz. Hebdomadaire de Médecine et Chirurgie*, No. 15, 1875; and *Clinic*, 1875) a case of orchitis from metastasis of mumps successfully treated by jaborandi. To the increased functional activity excited in the salivary glands by the sialagogue property of this drug is ascribed a diversion of the metastasis. Emery Desbrouses reports a similar case successfully treated by the same remedy. (Same Journal, April 30, 1875; also *Clinic*, 1875.) Dr. Eldridge, of New York, never fails to cure parotiditis by an emetic in 12 or 24 hours. (*Medical and Surgical Rep.*, vol. xxvi.)

Let us examine how effusion or dropsy occurs, and how absorption is produced. Under active vascular flow to an organ, as the parotid gland, the capillaries become dilated and permit free passage of blood through them into the veins; the arterial pressure is reduced, but venous pressure is enhanced. In the usual state of blood-flow there is some transudation of serum into the lymph spaces. This is constantly being removed by the capillary lymphatics, which, according to Recklinghausen, are everywhere distributed in the tissues in intimate relation with the bloodvessels through the lymph spaces. But where there is capillary repletion with exalted pressure in venous trunks, there is a greater amount of serum exuded into the lymph spaces than the lymphatics are competent to remove. When the secreting apparatus of the organ is in order, this surplus fluid is disposed of by appropriating it for secretion. But when the secretory structures are not operative, as in parotiditis, it accumulates in the lymph spaces or connective tissue, constituting effusion or dropsy.

It is, however, evident that this effusion can only increase to a certain extent. The pressure of the exuded fluid constricts the capillaries, exalts

the pressure in the arteries and lowers it in the veins. The pressure exerted by the serum in the lymph spaces is now favourable to drainage through the lymphatic vessels, since hindrance to the flow through the lymph trunks has been obviated by removal of venous pressure. Compensatory channels of circulation have also become established, and these make tributary vessels from the overflowed district, and so assist in draining it. The effused fluid has also become thinner from a loss of its salts. When now there follows an increase in the blood-flow through the capillaries proper to the part, in consequence of removal of some of the effusion by the lymph vessels and compensatory channels, absorption into the blood takes place, although there is increased venous pressure. It occurs more rapidly, too, because the power of osmosis with which a thin liquid passes through into a denser is very great.

Such is the phenomena of effusion and absorption as it may occur anywhere. In the parotid gland, however, there is another favouring element in absorption to be considered. The washed-off cells, which in the first place cause the obstruction in the ducts, may be compared to bladders which are filled to bursting. Under the extreme of tension they burst, allow the contents of the tubes to be flushed out, and permit the new cells to exercise their function of secretion. Thus another important channel is opened for the relief of overflow.

We return now to the action of jaborandi and emetics. The time when such agents would be likely to be employed would be in the stage of greatest enlargement, just before the decline. Jaborandi is to be classed as an emetic. While it may exert a sialagogue and sudorific action without emesis, just so may ipecac., belonging to the emetic class, which is absorbed into the blood and acts precisely as jaborandi. They cause dilatation of, and retardation of flow through, the surface capillaries by paralysis of the sympathetic fibres distributed to them. Hence we have copious sweating and secretions from mucous surfaces.

In the case of parotid enlargement. The increased blood-pressure in the parts contiguous would tend to augment the pressure exerted upon the ducts and clear them of their obstruction by bursting the occluding cells. The secretory activity of the gland would also be stimulated through the afferent nerve fibres, by the taste impression, and also by the relaxation of the sympathetic. In this way the tubes would be flushed out and relieved of all impediment.

It is clear that this enhanced pressure in tegumental structures, which relieves itself by such remarkable overflow upon the surface and into the mucous passages, would exercise a powerful depletory effect upon any part the seat of effusion. It must speedily reduce the tumefaction, whether the organ possess within itself any active excretory office or not.

ARTICLE VI.

FIVE CASES OF SPINAL PARALYSIS OF THE ADULT. By WHARTON SINKLER, M.D., Attending Physician to the Orthopædic Hospital and Infirmary for Nervous Diseases, Philadelphia.

IT is now several years since it has been recognized that there is an affection in adults which is almost identical with the disease so frequently met with in children, called infantile spinal paralysis.

The number of cases already reported is comparatively small, and there are still some points in the history of the disease which are obscure, so that new light may be thrown on the subject by the bringing forward of additional cases. This is my reason for offering the following histories:—

CASE I.—P. R., bartender, æt. 59 years, male; came to my clinic at Infirmary for Nervous Diseases, March 19, 1873. Healthy until present trouble. Went to bed well, with exception of a "cold," one night in September, 1870. Took a diaphoretic powder before retiring, and sweated very freely. Next morning he went into his bar-room, the floor of which was wet from having been scrubbed, and remained there for several hours. During the morning he noticed that the right leg was weak, and this weakness extended to the other. In a week both legs were so feeble that he could not use them at all. The same was true of the arms. During this time he had severe pain in the back, but there was none in the limbs, and sensibility to touch was not impaired. There were no cramps of the muscles. High fever lasted for the first week of the attack, and after this it left gradually. During this time the paralysis became complete, and the only movement that remained was the power of moving the fingers. *There was no paralysis of the bladder or rectum.* At the end of a week he began to use the arms. He was confined to bed for four weeks, when he began to walk with assistance. He states that for some weeks both feet were swollen. Gradual improvement has continued until now.

Present condition.—Walks with a cane, but can walk without one. He has good grip of both hands, and has all the movements of the hands and forearms, but cannot raise either arm from the side. Both deltoids are extremely atrophied, and so are the infra-spinate muscles; left trapezius somewhat wasted; no wasting of any other muscle. Still suffers from dorsal pain occasionally. Has no cerebral symptoms; digestion good; right leg eczematous and swollen; there is no œdema of the feet.

Electrical condition.—Both infra-spinati respond to a strong induced current. Posterior fibres of left deltoid can be stirred by the same current, but the anterior fibres of this muscle and the whole of the right deltoid fail to respond to the strongest current. The pectoral and rhomboid muscles act well; biceps and triceps respond feebly. Sixteen cells of the constant current move the deltoids. Electro-muscular sensibility decidedly impaired.

The patient did not come for treatment but once or twice, so no result could be obtained. The atrophy of the deltoids in this case was extreme, and the contrast with the well-developed arm presented a singular appearance.

CASE II.—C. T. L., æt. 46; has never had syphilis; temperate; harness-maker by occupation. General health has been good, with the

exception of attacks of asthma, the first of which was eighteen years ago; but there was an interval of several years, during which he had no asthma. He had an attack three years ago, which lasted three weeks. He ascribes this attack to his having worked in a damp cellar about a year previous, but since then he has worked in a dry place. Has had frequent attacks of asthma of greater or less severity during the past three years. In February, 1877, a bad attack began, and it continued without entire relief until the present time. He became very weak, and in May he lost the power of walking. About this time there began to be loss of sensation in the hands and feet; he could not button his shirt on account of inability to feel the buttons, and the feet felt as if there was thick paper covering the soles.

Shortly after this, that is, about the beginning of June, he lost power in the fingers completely. This extended to the arms and legs, and in less than two weeks he could not stir a muscle of the extremities; nor was he able to sit up, or even to turn over in bed. There was no paralysis of the bladder or of the rectum. There was no pain in the back, nor hyperæsthesia of the surface; neither was there any great loss of sensation. There was no formation of bed-sores.

In July he regained the power of moving the arms to a slight extent, and became able to turn in bed; in August began to stir the legs a little.

I saw the patient in consultation with Dr. Davidson, who had been in attendance several weeks, early in September, and found the following condition: Patient able to sit up alone. Muscles of arms and legs atrophied; hands and feet swollen; palms of hands sensitive and tender from the recent desquamation of thickened epidermis. Can extend arms, and can flex and extend forearms; can neither flex nor extend wrist; flexes and extends fingers of left hand slightly, and those of the right hand very feebly. Can flex and extend thighs; has but little movement of the legs, and none of the feet or toes.

Sensation.—Palms are hyperæsthetic to touch, but there is impairment of power to distinguish compass points. Is able to locate touch well. In the feet the sensibility is poor, but he can feel and localize deep touch. A few weeks ago there was a sense of constriction around the wrists, but that no longer exists. There are no reflex movements of legs excited by tickling the soles, and no reflex testicular movements from irritation of the inside of the thighs.

Electrical condition.—To the faradic current there is good response in biceps and triceps, both arms. In the left arm the extensors and flexors are moved by a strong current, but the interossei do not act. The muscles of the right forearm require a still more powerful current to produce movements. There is no electro-muscular contractility in the left thigh or leg, or in the right leg; but the right thigh muscles respond slightly. The constant current was not used. The left arm is the stronger of the two, and the right leg is stronger than the left. Bowels are regular; urine normal; appetite good. Still suffers from attacks of asthma at night. Heart and lungs healthy.

I admitted the case to the Infirmary for Nervous Diseases, November 10, 1877. The following treatment was adopted: Iodide of potassium in increasing doses until one hundred grains daily were taken; it was then reduced, and again increased. Massage and faradization of the limbs were used on alternate days, and strychnia and cod-liver oil were also administered. Under this plan the patient steadily, although slowly,

gained strength; and on June 12, 1878, just after his discharge from the hospital, the following note was taken: "He is able to get up unaided from a chair, and walks about with freedom. He still throws the foot down with a flap. Can extend and flex both legs; can extend both feet, but is able to flex them only slightly; has all other movements of legs; has all the movements of arms; flexes and extends wrists and fingers, but the latter movements are interfered with by stiffness of carpo-phalangeal joints. Cannot make a complete fist, nor can he approximate thumb and forefinger. The interossei muscles and thenar eminences are atrophied. There is no abnormal appearance of the skin of the hands; but a sense of prickling of the ends of the fingers may still be produced by passing compass points over them. Sensation still impaired; compass points, separated seven lines, are felt as one; at nine lines they are distinguished. Localization of touch good. Leg muscles do not respond to secondary induced current, full strength of battery, but the constant current moves them."

This is one of the instances which are occasionally met with of improvement in muscular power without any gain in the ability of the muscles to respond to electrical stimulus.

The large doses of the iodide of potassium were given with a view of controlling the attacks of asthma, but no doubt they also aided in improving the condition of the cord.

Aug. 12. I saw the patient again to-day; he is now able to approximate the thumb and forefinger of the left hand, although not yet able to perform this movement with the right hand.

The following case was in the Infirmary for Nervous Diseases under the care of my colleague, Dr. S. Weir Mitchell, for several months in 1876, and while there I had frequent opportunities for seeing the patient. I re-examined him, and took the following history on August 29, 1877.

CASE III.—F. E. T., æt. 24 years, a native of Pennsylvania, sailor by occupation. Says he has never had syphilis, and that he is temperate as to liquor.

In the spring of 1873 he received an injury from slipping while rolling logs; he got a wrench, and had pain and stiffness in the loins for two weeks. About two months after this he had an attack of pneumonia, which left him very weak. He then shipped on a vessel on the lakes to recruit his health. In July, while the weather was very hot, he was in the habit of bathing every night. On the night of July 26, after coming out of the water, he was seized with a chill, and this was followed by fever. The fever lasted three days. On the third day he had intense pain in the sacrum, but there was no pain elsewhere, and he had no delirium. His back felt "stiff," but he was able to walk from the wharf where his ship was lying some distance into the city. His left leg, however, felt weak, and this weakness increased during that day. For the next two days he passed no urine, and the doctor in attendance tried, unsuccessfully, to pass the catheter. After the application of hot hops and alcohol, he urinated about a quart. In the mean time the weakness of the leg increased, and by the fifth day of the illness he could not stir it. He thinks that the loss of power in the arm began after the leg had become completely paralyzed; but it never became entirely powerless. The arm

soon began to regain power. He was admitted to the Marine Hospital, Cleveland, and in about five weeks from the onset of the attack he began to walk on crutches, although there had been no real improvement in the ability to move the leg. The atrophy of the leg began at an early date. The arm regained its usual strength in four months. After a year he was able to discard his crutches, and to walk with a cane.

He was admitted to the Infirmary for Nervous Diseases in November 1875, and remained there until April, 1876. While here he improved considerably. He gained the power of using the thigh muscles, and of moving the toes.

Present state.—Patient thinks he has gained some general strength in the leg. His general health appears excellent. The left leg is the only part affected; it is greatly atrophied, and is very cold. He can rotate the limb, can flex and extend the thigh, can flex leg but cannot extend it, can extend toes, has no power to flex or extend foot; there is slight *pes equinus*.

Electrical condition. Secondary faradic current.—Anterior and posterior thigh muscles of the left leg respond to a strong current. None of the muscles below the knee respond to the strongest current.

Galvanic current.—Forty cells, current reversed; cause good movements in the thigh muscles, but muscles of leg respond only feebly. The gluteal muscles are not moved by the faradic current, but fifty cells galvanic current produce slight contractions.

Measurements of legs:—

Left leg four inches below patella,	9 $\frac{1}{4}$ inches.
Right " " " " "	12 $\frac{3}{4}$ "
Left thigh six inches above patella,	13 $\frac{3}{4}$ "
Right " " " " "	17 $\frac{3}{4}$ "

The patient walks well with the aid of a cane, and can walk without one. The foot is thrown down with a flap by a movement of the thigh. There has been no return of the bladder trouble.

CASE IV.—H. P. M., male, æt. 23 years. Has never had syphilis, and has always been temperate as to liquor and tobacco, never using the latter at all. On the 10th, 11th, and 12th of October, 1877, he was in Boston, and the weather being bad he was wet every day. He returned home on Saturday the 13th, and on Monday the 15th he first felt stiff and sore in the arms, and especially in the bend of the elbows, as if he had been rowing hard. He ascribed this to having been hoisting an elevator in his store on the day he returned home. On the next day the pain was in the shoulders, and his arms felt weak. On the 17th he complained of a sharp pain in the sciatic nerve, shooting down to the toes; the pain was not violent, but was marked. The day following the pain in the sciatic was less, but it was in both hips with occasional darting pains in the legs and arms. On this day he perceived loss of power in the legs, so that he went up-stairs with difficulty. He consulted Dr. Weir Mitchell at his office on this day, who found great feebleness of the grip, and loss of power in the legs, but no loss of electro-muscular contractility. The bladder and bowels were in their normal state. He was ordered potass. iodid. gr. v., t. d., and quinia sulph. gr. ix. daily. Until October 22d, the weakness increased without any other marked symptom except the pain in the hips, the left shoulder, and occasional shooting pains down the limbs. There was no fever or chilliness, nor had there been since the beginning of the trouble. On the 22d, at the request of Dr. Mitchell, I took charge of the case. He

had become so feeble that he was confined to bed, and was unable even to turn over without assistance. With aid he could get on his feet and then he could walk readily, but he could not raise himself up in bed. He had constant pain in the left shoulder, which was increased on motion, pain in both thighs, and sharp shooting pains over the scalp. There was also pain and stiffness in the temporo-maxillary articulations. There was no complete paralysis in any part of the body, but the feebleness of muscular movement was extreme. There was absolutely no loss or impairment of sensation, and no loss of power of the bladder. The bowels had been opened daily, but there was slight difficulty in defecation. The appetite was good, but the food "had no taste;" this was probably from the iodide. He had slept very badly the night previous. I ordered the quinia increased to gr. xii daily.

Oct. 23. He feels badly, and complains of ringing in the ears from the quinia, but there is less neuralgic pain in the scalp; he scarcely slept all night and was very restless. There is slight facial paralysis on both sides. There is inability to close the eyes completely, and the lower lip hangs as if swollen. The tongue is protruded with ease. I stopped the quinia and iodide and gave instead potassii bromid., gr. x, and vin. ergot, f $\frac{3}{4}$ ss every six hours. I directed the shoulders rubbed with lin. amm., and put the patient on nutritious food, with beef-tea, milk, and whiskey f $\frac{3}{4}$ ss three times a day.

24th. Patient feels much better; he slept soundly all night. There is no pain or stiffness in the jaws, but to-day the facial paralysis is complete. Emotions produce no impression whatever on the countenance, and the eyes are constantly suffused with tears. He is unable to drink from a cup or tumbler, unless he allows the liquid to run back into fauces, when he swallows readily and there is no regurgitation through nose. The tongue movements are perfect. There is no impairment of voice. Sensation of face normal. Hearing and smell unaffected. There is no diplopia nor dimness of vision; the pupils are widely dilated and respond to light sluggishly. He feels stronger generally.

25th. The patient is upon a lounge, and is gaining strength; walks well, when helped to feet, and can bend body forwards. Grip about the same. Facial paralysis unchanged. The only pain he has is in the left shoulder and in the thighs, the latter occurring only when he is attempting to bend body forwards. The tongue is clean, the appetite excellent, and digestion perfect.

27th. Has gained everywhere except in face; facial muscles respond readily to a secondary induced current, from Gaiffe's induction machine, which is painless. Continue bromide and ergot, and use electricity to the face.

31st. Face improving; can smile, frown, etc. Right side of face much better than left; right arm and leg also strongest. Continue faradization; stop bromide and ergot; give strych. gr. $\frac{1}{60}$ th t. d.

Nov. 3. Face almost completely restored to usual condition; he can whistle. Left leg still weak; in going up stairs he cannot put left leg up first and raise body on it. Complains of occasional pain in left wrist and hand, none elsewhere.

11th. Face in normal state. Legs and arms about stationary; has not improved materially in grip or in power of going up stairs since last note. Give strych. gr. $\frac{1}{30}$ th t. d. Faradize leg and arm muscles.

Dec. 11. Has gained greatly. Can flex left thigh as well as right; in

going up stairs "puts one foot before other" in usual manner. Is always better in evenings than mornings. In morning there is no stiffness or numbness, but he cannot walk as well or lift legs as well. Stop strychn. R. Ext. ergot, gr. iiss t. d.

16th. Is better since taking the ergot. Is as strong now in morning as evening.

28th. Improves steadily; rather more slowly now, but still gains. Stop ergot. R. Pil. quin. fer. et strychn. t. d.

June 15th. Is perfectly well. Has been riding on horseback for past two months, and gained much muscular strength. At first had much difficulty in mounting his horse on account of weakness in left leg, but now has no trouble.

In this case the atrophy was not marked, although the limbs became materially smaller; but this was evidently due to the fact that improvement so soon began.

CASE V.—C. R., male, æt. 30, applied for treatment at the Infirmary for Nervous Diseases April 9, 1875. In September, 1873, was taken ill with what his doctor called cerebro-spinal meningitis. He had high fever, with violent headache, diplopia, and slight delirium. He was at no time unconscious. He had pain in the back and inability to move the head. He states, however, that he had had the backache for a year. There was retention of urine for twenty-four hours, and he was constipated. The diplopia lasted only one day, it and the headache having disappeared after the application of a blister to the neck. On the second day he had violent pain in the legs, and he found on attempting to stand that there was loss of power in them; the arms were unaffected. There was no loss of sensation in the legs, but they felt somewhat numb.

The loss of power was complete at first, and it was not until five or six weeks that he began to move the toes of the left foot and four or five months before he could walk with crutches. When seen by us at the hospital both legs were atrophied, and he walked with difficulty on crutches. He was unable to lift his feet or legs, but had fair power in the flexors of the legs, so that he could step over obstacles by going over them backwards. The eyes were examined with the ophthalmoscope and found healthy. The treatment prescribed was iodide of potassium in increasing doses, and faradization and massage of the legs. In a short time strychnia was added to the treatment.

In three months he was able to do without crutches and walk with canes. The extensor muscles of the legs, however, improved but little, and he was still unable to flex the thighs. The strength of the limbs gradually improved, and the same treatment, with slight variations, was continued for nearly two years.

Aug. 12, 1878. Re-examined. Patient can walk without a cane, but he is still unable to raise the thighs when sitting, or to extend the right leg at all; he can extend the left leg to a very slight degree. He can flex both feet and can strongly flex the legs. The legs are considerably atrophied—

The right thigh measures	16	inches.
" left "	"	15 $\frac{5}{8}$ "
" right leg	"	13 $\frac{1}{8}$ "
" left "	"	12 $\frac{7}{8}$ "

Electrical condition.—All of the muscles of both legs, except the anterior thigh muscles, respond to a strong secondary induced current. The thigh muscles are moved readily by a current from twenty-four cells of Stohrer's small constant current battery. Sensation normal.

The patient's general health is good, and he superintends a large business, which requires him to be a great deal on his feet.

Dr. Seguin¹ has collected forty-five cases, and has given the disorder a close and exhaustive study. Dr. Althaus published in the April number of this Journal two cases with some valuable remarks. One or two other cases have also been reported.

Now all observers agree that the anatomical lesions of the disease are the same in adults and in children. That is, the disease is located in the anterior cornua of the spinal cord, and the nerve-cells in this locality are especially the seat of the lesion. But the symptoms and progress of the affection at the two periods of life are sufficiently different to warrant the division, by some writers, into "spinal paralysis of adults," and "spinal paralysis of infancy."

I cannot but think that there are some anatomical differences, which as yet have not been detected, but which influence and produce the variations of the disease in adult life and in childhood.

Take for example the distribution of the paralysis. In two of the forty-five cases of adult spinal paralysis collected by Dr. Seguin, and in one of my own five, there was facial paralysis. In over one hundred cases of infantile spinal paralysis which I have seen, there was not one in which there was any paralysis of the face, and the only cases I have seen reported are those of West,² and these I feel sure were cases of peripheral paralysis of the seventh nerve.

In adults there is more apt to be bladder palsy, but this is usually transient. There is also more disorder of sensation in these than in children. Numbness and formication of the extremities are common initial symptoms in the former, and anæsthesia or hyperæsthesia are not rare.

In infancy the disease is stationary after the retrocession of the paralysis; this I believe is the invariable rule. While in adults it not unfrequently occurs that the paralysis spreads to parts not originally involved, and in some cases reported, death has followed from extension of the paralysis upwards.

The causation at all periods of life is rather obscure, but in a large number of cases in grown persons exposure to cold, chilling of the surface, or checking of some discharge seems to have been the exciting cause. In children it is difficult to point out the origin of the attack, unless, as I have suggested in a previous paper,³ the influence of hot weather upon a

¹ Myelitis of the Anterior Horns. New York, 1877.

² Diseases of Children.

³ American Journal of Medical Sciences, April, 1875.

teething child is sufficient to render the system peculiarly susceptible to the disease.¹

The above-mentioned facts lead me to surmise that in adults the primary lesion is a more or less general congestion of the cord, with myelitis of the anterior horns and subsequent degeneration of the ganglionic cells; while in children the cells of the anterior cornua and the gray matter itself are directly affected without so great an extent of accompanying congestion. The great improvement which follows the use of ergot in many cases of adult spinal paralysis seems to further confirm this view.

The points as to the diagnosis of the disease are fully given in the text-books, so I will not dwell upon them except to remark upon the resemblance of *spinal congestion* to the affection under consideration in its early stages. In spinal congestion the paralysis is never complete, there is no subsequent atrophy, and there is more apt to be loss of power in the bladder and rectum. Some of the cases reported seem much like the so-called "*acute ascending paralysis*."

Dr. Seguin considers a diagnostic feature between this disease and spinal paralysis of adults the fact that in the latter there is no respiratory disturbance, but in one of his own cases (Case XXXII.) death occurred from asphyxia.

Dr. Hammond considers the two affections identical, and it certainly seems impossible to make a diagnosis between them during life, but in a case of acute ascending paralysis reported by Desjérine,² no trace of disease could be found in the cord after death.

Most writers express a rather unfavourable prognosis, but I am inclined to believe that in most cases a good result can be obtained if the patient is seen early enough. In one of the five cases I have reported recovery took place, and in another the patient, although not entirely well, is vastly better, and is continually improving, so that I think we may look for complete restoration of the use of his limbs. Another case had no treatment, and in the remaining two, although coming under treatment at a late period, one two years, and the other eighteen months after the onset of the paralysis, there was great gain.

The treatment, I think, should consist at first in the administration of ergot, combined with bromide of potassium; if there are head symptoms, local depletion and counter-irritation over the spine, and later the use of iodide of potassium and strychnia. Dr. Althaus recommends phosphorated cod-liver oil. Electricity and massage are highly important agents, but it must be borne in mind that too great care cannot be observed in the application of these means, especially of the former. Great harm is often done to a paralyzed muscle by the too prolonged application of electricity.

¹ Out of seventy-two cases which I have examined in regard to the season of year at which the attack occurred, in sixty-five the disease came on between May and October, and in fifty-two of the sixty-five in the months of June, July, and August.

² Hamilton on Nervous Diseases, p. 253.

ARTICLE VII.

THE DIAGNOSIS OF HIP-DISEASE. A CLINICAL CONTRIBUTION. By V. P.

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If one study in the field of the microscope the amœba, and make in slow succession a half dozen sketches of this elementary form of life, he will recognize the marked change in shape between the first and last sketch; so if one record the impressions a patient, with hip-disease, for instance, gives him at different observations, a study of such impressions in relation to one another will enable him truly to interpret the symptoms, and to give an intelligible diagnosis. The hospital with which I have the honour to be connected has afforded me an excellent opportunity for this kind of systematic observation, and the evolution of disease thus studied in its various stages has proved so instructive that I am persuaded a record of the cases will be of value to the general practitioner.

I. *The Normal Course of Typical Cases.*

CASE I.—Female, æt. $2\frac{1}{2}$ years, seen first in the out-door department July 26, 1876. The child is plump and hearty looking, though on walking the right side is favoured, and the mother asserts that there is no pain night or day. No tenderness on pressure at any point, no change in contour of the nates unless it be in a possible shallowness of the trochanteric dimple. Flexion and extension perfect and painless, as also adduction, though when complete abduction is made there is a little resistance on the part of the adductors; no atrophy. During the month of May preceding the child was thought to have fallen from a crib, walked lame next day, and this lameness has continued to present time, without any evidence of pain. In the maternal family history there is a phthisical element. Our diagnosis lay between a periostitis near the trochanter, and a chronic articular osteitis. The treatment to be expectant, and this morning a spica is applied, and iodine liniment ordered.

Aug. 9. Limp still marked, toes inverted a little, nearly one-half inch, atrophy of the thigh, no resistance to passive motion. An alterative tonic is ordered and abstinence from exertion enjoined.

16th. Lameness more marked, in fact child does not care to walk at all; nates flattened, though there is no pain, tenderness, or muscular contraction. A fly blister, the vesicated surface to be freely poulticed, is ordered.

28th. Child refuses to walk; had no pain until the night of the 24th, when she cried considerably, and this was attributed to a strain that afternoon caused by a forcible eversion of the limb, the foot being caught in the bedclothing as the mother was in the act of turning the child in bed. Since this accident the patient has suffered more or less; still there is, this morning, perfect motion at the hip-joint active or passive. The thigh remains one half inch small.

Sept. 9. A little resistance to complete abduction, and child is reported as restless at night.

28th. No apparent change.

Nov. 24. Movable tumour at the insertion of tensor vaginæ femoris, semi-elastic, and about the size of an English walnut. Rotation inward and

flexion are easily made, but rotation outward and complete extension cannot be made without pain.

Dec. 28. Little change in condition of limb since date of last observation. During the past month, however, there has been some gastric derangement, a varicella, and a bronchitis, all of which caused some loss of flesh and seemed to develop many signs of struma.

Feb. 1, 1877. Distinct fullness over crest of ilium, that on thigh having increased a little; motion at joint limited in flexion beyond an angle of 90° , and also in rotation.

March 31. Suspicious prominence of spinous processes of the first and second lumbar vertebræ observed on standing, though when extension is made this disappears entirely. If child be placed on the lap in prone position, and the head and buttocks be pressed in the direction one toward the other, pain is complained of in lumbar region. The thigh is semi-flexed on pelvis and fixed by muscular action. These signs are observed with much interest during the spring and summer.

Aug. 13. General condition of child indicates improvement; there is no longer any spinal prominence or tenderness, no fullness over iliac crest. The notes to April 1, 1878, show a steady improvement in locomotion, and although the tumour over upper portion of the thigh is still present, there is motion at the joint over an arc of 25° , the limb is extensible to an angle of 140° , the limbs are of equal length, there is no pain, and the prospects for a useful member are flattering.

II. *An Irregular though not an uncommon Course of the Disease Illustrated.*

CASE II.—July 20, 1877, a boy æt. 8 years was brought into the office, and I at once recognized him as an old patient long absent. I, of course, censured the mother for neglect, but she was positive in asserting that at her last visit three years ago the case was pronounced cured; so on referring to the books I found a record of the diagnosis April 19, 1873, as “hip-disease, end of first stage,” and a note July 18th same year “no signs of disease.” This morning his left thigh is flexed on pelvis at an angle of 135° , is rotated outward, the limb in fact is the typical position for the second stage of hip-disease. He is very lame; screams at night, waking, as it were, out of sleep, and in the morning has no recollection of having suffered or screamed during the night. Refers the pain by day to the parts on either side of the patella; there is no swelling or tenderness around hip or knee, both of which seem peculiarly free from disease so far as external appearances or handling are concerned. Flexion and abduction can be made without pain or resistance, but other motions are limited by muscular action; when passive motion is made he complains of pain at the knee. There is no spinal tenderness, no angular deformity, no reliable sign of vertebral disease. The mother declares that the boy was well and active on the 15th inst., but did not rest well on the night of the 9th; that he was out for a long walk on the 12th, slept well that night, and on rising in the morning was lame, but was free from lameness on the 14th and on the 15th; that all of the present signs date from the 16th. Last winter, she reports, he had very nearly the same train of symptoms one day after a storm, and recovered spontaneously. The attack in 1873 had lasted two or three months prior to his application here for treatment. With the single exception of the transient lameness of last winter, just mentioned, he is reported to have been absolutely free from anything like hip-disease since July, 1873. One year ago he had pertussis without any recognizable sequel.

There are nine children in the family, and this, the seventh, is the only one ever out of health, so claimed. He was always considered a delicate child prior to the spring of 1873. A severe dentition with an occasional convulsion, a series of convulsions when two years of age, and a scarlatina shortly thereafter, rubeola next in turn, make up his personal history. He is now fairly nourished, though the four lower and two upper incisors are distinctly notched and irregular, while two molars on the left side have each six distinct processes. The mother is of a temperament markedly nervous, and her appearance forcibly suggests struma, the maternal grandfather died of "rheumatic gout," the grandmother of "apoplexy." The father seems healthy, and gives a good family history. No specific taint is discovered, though strongly suspected in view of the presence of Hutchinson's teeth in the child. Fly blister, poultices to follow, ordered to dorso-lumbar spine.

July 27. The deformity is much less, and the boy feels better. A fourth of a grain of the extract of belladonna three times a day is ordered. The treatment now is directed to the spine more as a solution to the diagnosis than as a therapeutical measure. It will be remembered that I found no spinal tenderness, and hence I had no good reason for considering this a spinal arthropathy.

Aug. 3. Mother calls to report the child free from pain, and the limb perfectly straight, unless after exertion.

11th. Examined, and no resistance to normal motion in any direction found, except on complete extension. In view of a possible syphilitic element in the etiology, potass. iodid. gr. iv ter in die is ordered.

29th. Scarcely any lameness perceptible; stands with limbs parallel; contour of nates normal; motion good in every direction, though, when thigh is completely flexed on abdomen, he complains of pain at the knee.

Sept. 26. Flexion and extension to extreme limit; rotation inward to extreme limit causes the boy to wince, though he protests against feeling any pain. The iodide is continued.

Oct. 17. Complete relapse, which the father attributes to a strain the boy received last visit on the way home. The iodide is discontinued, and the belladonna, in fourth-grain doses, ordered again. A liniment for the hip is likewise prescribed.

Nov. 7. Improving again at same rate as before.

April 17, 1878. Is seen to-day, and the limb is found again in position of second stage. The father reports that in November last he made a good recovery from that attack, and has been straight and active until three weeks ago, when present relapse appeared. There is found also to-day, for the first time, dorsal tenderness.

Case I. I believe to be a typical one of chronic hip-disease, the history, progress, and all corresponding so well. The second one I report as hip-disease, with relapses. I report this, however, with some hesitation, but shall presently give two quite similar to this; one wherein the diagnosis was eventually fully confirmed. I have not, as yet, employed any anti-malarial therapeutics, because I have failed to get a history of any reliable signs of malarial poisoning. This treatment, however, shall be the next adopted, because of the locality in which the patient resides—Williamsburg, Long Island. The two I am now about to record may assist in diagnosing the one under discussion.

CASE III.—Female, æt. 8 years, admitted to hospital January 3, 1871, with a poor family history, *i. e.*, a tubercular one; a personal history of rubeola and pertussis two years prior to this state; a fall from a balcony nine months after the exanthemata; confinement to bed two weeks immediately thereafter as a consequence, pain being referred to the groin; then a partial recovery, so that she was enabled to attend school, and run about without any inconvenience, save an occasional pain in the groin; a relapse six weeks ago, with severe pain in the region aforementioned aggravated at night, starting pains, etc.

Her general health has suffered very little impairment; she walks decidedly lame; stands resting the bulk of her weight on the left limb, the right being semiflexed at the knee, the foot everted. The nates are broadened, fold lowered, and cleft about normal; tenderness on pressure behind trochanter, and on percussion and concussion thereover; considerable prominence in this region; pain complained of at the knee, and also at the hip if flexion be attempted. A diagnosis of hip disease is made, and constitutional treatment ordered. From this date to the 1st of December the disease produced considerable suffering, and more or less deformity. Blisters were applied when the pain became severe, and the case did so well that, by January 22, 1872, the child was discharged, walking without any lameness whatever, deformity entirely overcome, motion restored to the normal arc in every direction, save in complete flexion. No significance seems to have been attached to this, and a cure was recorded.

June 4, 1873—nearly eighteen months later—the patient is readmitted, a relapse having recently occurred, and the disease is now well advanced into the second stage. The former treatment substantially is adopted, and by the 29th her symptoms all denote improvement.

Nov. 9. Suffering greatly, and confined to bed. The subsequent notes of the case tell only of a gradual transition into the third stage without the formation of abscess, with comparatively little pain, with little deformity, but with the usual amount of shortening and lameness. By January 7, 1876, this stage is reached, the limb is one inch short, two and one-half inches small at the thigh, though not in any angular deformity, and withal very serviceable. Three or four attacks of pain, neuralgic in character, have occurred since this last note, but the disease is long since arrested, the patient discharged, and walking with very slight inconvenience.

CASE IV.—*Hip-disease, first stage, apparent Cure; relapse at the end of three years and three months; Death from Adenia; Autopsy.*—Male, æt. 4 years; admitted to the hospital March 29, 1871. Family history not obtained with any degree of completeness, the only notes found recorded are that the mother is dead, and that the patient has a brother afflicted with hip-disease, third stage, and grave in character. It is also recorded that this child fell from a velocipede about one year prior to his admission, and a few months later complained of pain in the right knee. This became severe, and was referred to the hip, causing the usual night screams, the morning stiffness, etc.

Condition on entrance to hospital as follows: plump, and well nourished; boy standing with the right lower extremity semiflexed, everted, and resting on the toes, and walking with a very marked limp; nates on right side broadened, natural depressions effaced, fold raised, and cleft inclined to the left; thigh flexed on pelvis at an angle of 150° , and held here by muscular action, though flexion can be carried to 90° without causing

much pain. The diagnosis is made without reservation, and, under the usual treatment of the hospital, the case made good progress; though in the month of May there occurs, without known cause, a suppurative middle-ear disease, left side.

Sept. 8. It is noted that his condition is such as to justify his discharge.

Oct. 6. General health seems excellent; he stands squarely on both feet, and walks without a trace of lameness; no atrophy exists, no tenderness or pain on complete flexion or extension, or on concussion of trochanter—in fact, no sign of disease in or about the hip can be detected. His friends had deserted him, and no home could be found; hence he remained in the hospital, different persons promising to adopt him, until the beginning of 1875. During that period never a sign of disease was observed, and the cure was regarded as well established. The ear disease continued, however, after the usual manner.

January 1, 1875. Note is made of an enlargement of cervical glands right side three months' standing, coming on without any known cause, and steadily gaining ground despite all treatment. Hip still free from any sign of disease.

2d. After perfect immunity for three years and three months, the hip is the seat of great pain, and the boy is abed with a high temperature, and crying if any motion at the joint be attempted. Fly blisters and poultices.

16th. Acute symptoms relieved, and the boy going around the ward, though joint still tender and glandular infiltration increasing. A general glandular enlargement, or adenia, set in, the boy became emaciated to a skeleton, and death by asthenia occurred February 28.

Autopsy twenty-four hours later, conducted by Dr. Edward G. Janeway, pathologist to the hospital. Body greatly emaciated, and skin jaundiced about eyes, scrotum and right lower extremity; both lower limbs lie in complete extension, and motion at joints is free.

Right lung slightly oedematous, otherwise normal, and old pleuritic adhesions are extensive; left lung and plura normal, as also the heart. Peritoneal cavity contains about a pint of a yellowish jelly-like material; liver is one-fourth larger than normal, and on the surface as well as on section there is a mottled appearance.

In the gastro-hepatic omentum a gland the size of a walnut presses against the ductus communis choledochus, the pyloric orifice of the stomach and the receptaculum chyli. The microscopic appearances of this gland are normal. Mesenteric glands enlarged, as likewise the cervical, from the mastoid process to the clavicle, varying in size from a hazel-nut to a walnut. A deeper gland separates the deep jugular from the carotid, a space of one inch, and presses against the pneumogastric. Pus is found in the right middle ear, extending into the mastoid cells.

The right hip-joint being opened, the capsular ligament is found intact, there is no fluid within the cavity, and suction force is normal, while the ligamentum teres is easily detached. Head of bone presents a dirty yellowish aspect, with a groove extending from ligamentum teres towards trochanter minor, intersecting a similar groove about the insertion of capsular ligament. In this groove is new connective tissue. At one point the cartilage is completely eroded; head flattened. On vertical section there appear three yellowish spots, two above and one below the line of epiphysial union, which line of union is carried up one inch; cartilage is one-half the normal thickness, and this, as well as the bone underlying,

is, in the field of the microscope, seen to be in the process of fatty degeneration. The head and neck of the sound femur are also removed, and the above description is comparative. Blood examined microscopically, and found normal.

The accompanying cuts show very strikingly the pathological changes, with the exception of the colouring.

The whitish spots in the head and neck of Fig. 1, in the original sketch as made by an artist at the post-mortem, are yellowish, showing the fatty metamorphosis to perfection. Fig. 2 is the sound bone, and is inserted for comparison.

Fig. 1.



Fig. 2.



The two cases just recorded illustrate: 1, the insidious mode of invasion; 2, the behaviour of the disease when the general health is improved, and the patient placed under a favourable hygiene; 3, the remissions, or periods of apparent recovery, lasting even three and one-fourth years; 4, given the diathesis, the ease with which the disease can be induced on the slightest provocation; 5, the dominant tendency of hip-disease to progress unimpeded through the three stages. Case IV. illustrates the pathology, viz., a central osteitis extending to the periphery, and ultimately destroying the joint structures. With cases III. and IV. in mind, I feel, in a measure, justified in assuming case II. to be one of chronic hip-disease.

III. Cases Illustrative of Acute Synovitis of the Hip-joint.

CASE V.—On the 19th of February, 1874, a fair-haired German girl, æt. 6 years, was brought into the office, and the pain suffered by the child was so intense that it was with the greatest difficulty an examination could be made, in fact this was deferred until the patient could be gotten into

the ward, and in the mean time a history was obtained. The family was found healthy and free from disease; the girl herself was an only child, and had always enjoyed excellent health. She was considered perfect in health and limb on the evening of the 16th instant—three days ago—went to bed in that condition, and was awakened suddenly during the night by acute pain referred to the right hip-joint. Her screams alarmed the household. Febrile movement was marked, and in the morning the child was unable to stand on the limb at all. The pain and tenderness seemed to increase, and the loss of strength from sleeplessness and general constitutional disturbance soon became alarming.

On examination this evening the tongue is coated, the patient cannot be induced to stand alone, much less to take a step, and after much persuasion she allows herself to be held in the standing posture, when the right lower extremity is suddenly adducted, advanced, and semi-flexed; little or no change has taken place in the nates, there is no atrophy of the limb, and no shortening. Any attempt at active or passive motion causes intense pain at the hip, though by grasping the thigh carefully and firmly, making traction the while, the muscles hitherto in tonic rigidity gradually relax, and a great sense of relief is experienced. Acute synovitis of the hip is diagnosticated, and a fly blister applied to-night.

March 1. Almost entirely free from pain, and condition is much improved.

21st. A second blister applied on recurrence of pain. From this time forward the case progressed as favourably as could have been desired, and on October 21 it is recorded that little or no deformity exists; the child walks with comparative facility. An examination is made August 4, 1875, no unfavourable symptom having occurred in the mean time, and the result is as follows: general health robust; stands with right limb slightly advanced, walks and runs freely, though favouring this side; contour of hip almost perfectly restored; flexion, extension, ab- and adduction easily accomplished; no pain or tenderness, no shortening or atrophy; with the exception of a mere limp the cure is perfect. This lameness must be due to some loss of substance in the joint structures—a theory very plausible in view of the severity of the primary lesion. The girl was seen by me a year or so later, and this limp could scarcely be detected.

CASE VI.—A boy, 9 years of age, is carried into the waiting rooms of the out-door department August 29, 1873. He screams and raves like a mad-man, so intense is his suffering. His nervous system seems at the point of exhaustion. The sight is a pitiable one, and one that I shall never forget. His immediate admission to the hospital is advised, and gladly acceded to. It is learned that about four weeks ago a lameness came on suddenly, and without apparent cause. This seemed at the time trifling, and only until within a few days ago did the acute symptoms supervene. The family history furnishes nothing important. The boy is thin, and poorly nourished, haggard looking, his tongue is heavily coated; with much difficulty and much pain he stands alone, though only for a few moments; is totally unable to walk. Thorax, abdomen, and spinal column examined, with negative results. Right nates very much enlarged, fold obliterated; tumefaction around the hip is very great, and the temperature of the parts is perceptibly elevated; position of limb advanced, semiflexed and everted. Tenderness in groin and around trochanter well marked; movement of the limb not tolerated; no atrophy or shortening. Over the nates is an excoriated surface, the result of some recent vesicant. To this surface a

poultice is applied, and this is to be renewed every six hours for two or three days.

Sept. 5. Six days after admission—all the acute symptoms have subsided, and the patient is able to stand, and even walk a few steps alone.

Oct. 2. A most marked improvement has taken place; scarcely a sign of disease remains about the hip; walks with a very slight degree of lameness, and he is to all appearances cured.

Dec. 12. Health in fine condition; boy stands squarely on both feet, walks and runs freely, no limp whatever being present; normal contour of nates restored; no tenderness on rough handling. Patient discharged cured. Up to May 1, 1878, I am credibly informed, no signs of relapse have ever appeared.

CASE VII.—Male, æt. 9 years, admitted to hospital September 5, 1877. Fairly nourished, though there is evidence of slight febrile movement in the frequency of the pulse, 120, and in the temperature, $101\frac{1}{2}^{\circ}$. Stands with left thigh advanced, knee semiflexed, and foot everted a little; unable to walk without great pain; nates enlarged, and presenting a sense of elasticity to the touch; the parts are tender, while the surface temperature is two degrees lower than at a corresponding point on the opposite side. Muscles unusually tense, and groin very tender; extension beyond 150° and flexion beyond 90° are painful, though pressure of the limb upward toward the acetabulum elicits no pain. No spinal tenderness, no ilio-costal fulness, no tenderness or induration in the iliac fossa. Paternal and maternal family histories good so far as can be learned, and the boy's own history shows excellent health from infancy to date of present disease, which seems to have resulted from a fall into a cellar, August 18th, seventeen days ago, as he was lame next day, though the acute symptoms are only of two days' standing. The diagnosis is held in reserve for a few days, and the case treated as if one of hip disease.

Sept. 15. Patient has grown steadily worse, and it is with great difficulty he can be moved; effusion about hip increasing; circumference upper one-fourth $16\frac{3}{4}$ inches, middle third 9 inches, and at same points fellow limb $12\frac{3}{4}$ and 7 inches; blistering has afforded no relief.

20th. Confined to bed since date of last note, screaming with pain all through the night unless under the influence of opiates. His decubitus is prone, constitutional disturbance great. There seems to be no doubt as to the diagnosis now—*acute coxo-femoral synovitis with impending suppuration*. Full doses of the tincture of the chloride of iron and chlorate of potassa are given in glycerine, while evaporating lotions are kept continuously to the hip.

22d. Measurements at same points as above recorded, right side. 18 and $13\frac{1}{2}$ inches, while the circumference just above the knee is $10\frac{1}{2}$ inches, showing the extent of the infiltration throughout the thigh. An abscess of enormous size has formed, throwing the thigh in great deformity, and reducing the boy to a condition of great emaciation.

Oct. 1. An incision is made giving exit to at least two pints of pus of good consistence. Tonics and stimulants administered unsparingly.

2d. Improvement very marked.

4th. Sitting up to-day, and free from pain.

17th. Wound has healed; limb gaining strength daily, and boy now walking about by the aid of a chair.

Nov. 10. Has regained flesh; hip is in a good condition; contour of nates restored; boy walks and runs with only a slight halt perceptible.

Dec. 8. Discharged cured. No deformity; no resistance to normal motions to full extent; no difference in size of limbs; no lameness.

IV. *The Difficulty of making a differential Diagnosis between Infantile Spinal Paralysis in the first stage and Hip-disease in its first stage.*

Occasionally the early signs of hip-disease correspond so closely with those of infantile paralysis that a differential diagnosis is by no means easy. One would think it an easy matter to diagnosticate a paralysis, yet such is not always the case. If the child be only recently ailing, if fretfulness and hyperæsthesia be present, if there be a history of a fall or other injury (the easiest part by all odds of the history to get), the case becomes very obscure. Take as illustration the following.

CASE VIII.—A male child, æt. 2 years, was brought to the office Sept. 16th, 1874, for examination. He was healthy in appearance, but was a little peevish. As he stood in a state of nudity, the left natis was observed to be flattened a little, and the fold was lowered. Pressure over the trochanter elicited tenderness, and the least passive motion of the limb caused the child to cry out as if in pain. Measurement gave only a shade of atrophy. The skin felt cold, and the surface thermometer indicated a slight diminution in temperature. There was lameness, but as the child walked one could see that this was not due to the action of muscles in protecting the hip; the gait was unsteady; a tottering at the knee was observed, and after going a few steps the limb gave way, and a fall was the result. The electrical examination was unsatisfactory, though there seemed to be a diminution in the force of the faradic contractions. The mother, in giving the history, stated that seven nights ago, without any provocation, so far as she knew, the child became a little peevish and rested badly; slept late, however, the morning following, and walked on rising; but that after a few hours she noticed the child fall, get up again, and after awhile fall again; that he cried and moaned the second night, crying the more if the left limb was moved; that he was very lame on the second day; that she took him to a surgeon of acknowledged ability—a man whose diagnosis it would be arrogance to question; that after a long examination she was told a hip-splint must be procured as early as possible; that she could not meet the expense of the apparatus, and that she comes here now two days later hoping to get the needed splint free of charge. In the family history a maternal aunt is reported to have died of hydrocephalus at the age of eleven years. The history of the invasion, the unsteadiness of gait, the age of the child, suggested to my mind a paralysis of a group of muscles of the limb, and to this diagnosis I adhered especially after an examination on the day following. Santonine was prescribed in order to remove any causes acting reflexly in the intestinal canal. No results were obtained from this, and after one or two more visits the child was lost sight of for nearly a year, when the mother brought him back to be treated for a calcaneo-valgus paralytic in origin. Apparatus was applied, and electricity, both currents, used two or three times a week. The patient has attended irregularly, but has worn a brace constantly. April 20, 1878, there is one-half inch atrophy of thigh and of calf, the foot is one-half inch short, is in valgo-calcaneous, though easily held in normal position. The reaction of the muscles on posterior surface of leg to faradism is abolished, to galvanism is almost normal.

CASE IX.—Female, æt. 2 years, presented in out-door department Oct. 3, 1877. Reported as having been seized with a slight febrile attack five weeks ago. This continued five days, and at night the child was worse. During that period, and for a week later, the child refused to walk, and, if placed on feet, would cry as if in severe pain. Gradually improved for a week, but for the past two weeks the improvement has been less marked. Latterly has had no pain whatever even when walking freely. Patient seen twice during the fourth week by a surgeon whom the profession regards as an expert in this specialty, and this gentleman writes that, after careful examinations, he locates the disease within the hip-joint, as he finds unmistakable muscular rigidity about the hip. He makes a differential diagnosis, however, from infantile paralysis. This morning the nates on left side is flattened perceptibly, the calf is one-half inch small, motion at the hip-joint is made to the normal extent in all directions without pain, though there seems to be a little resistance to complete abduction; there is marked diminution of the tibialis anticus in reaction to the faradic current. There is lameness, but this is not like that due to disease of the joint. Our diagnosis is infantile spinal paralysis confined to a single muscle or group of muscles, and treatment instituted therefor. There is now, April 22, 1878, a slight degree of varus, the limb feels colder than its fellow, there is atrophy, and the child becomes lame after moderate exertion—tires easily. Neither has now, nor has had since October, any pain whatever, diurnal or nocturnal, and the limb can be handled without any discomfort. My friend, Dr. Horst, of the hospital, has just visited the little patient, and examined carefully for any muscular rigidity on active or passive motion, finding none. He verifies the diagnosis of paralysis.

The case I am now to report was first diagnosticated by me as infantile paralysis, and, after a few examinations, I recognized my error, changing completely the diagnosis.

CASE X.—A buxom, hearty-looking female child, æt. $4\frac{1}{2}$ years. Came under observation for the first time in the outdoor department April 10, 1877. The gait suggested an incipient hip disease, yet the history and the facts elicited by examination seemed to point unerringly to a slight stroke of acute spinal paralysis. The aunt who accompanied the child—a very intelligent woman—states that one week ago nothing whatever could be discovered; that a change was made in the stockings—from long to short ones—at that time; and that, while the little girl was out playing, she complained of pain along the outer side of the right leg, the limb became tender to handling, and felt much colder than its fellow. The patient is examined in a state of nudity this morning. No change in the nates can be discovered; no resistance to motion, active or passive, at the hip in any normal direction or extent; the limb is perceptibly colder than the other, and, by the surface thermometer, is 1° lower; there is no atrophy of the thigh, but the calf and the ankle are one-fourth of an inch small, though the reaction to both currents is normal. There has been no screaming at night. The family history would lead one to incline to joint disease, though, as there is a history of no starting pains at night, as the muscles present no contraction, however slight, and as any amount of handling elicits no tenderness at the joint, disease here is excluded. The treatment is expectant.

April 17. The lameness is not so marked, though the temperature of the limb is $1\frac{1}{2}^{\circ}$ lower than its fellow; electrical reactions still normal.

26th. Temperature same on both sides; calf one-fourth inch small; nothing else observable save the limp.

May 16. Walks this morning as if the hip were surely the seat of disease; there is tenderness on deep pressure in the groin; thigh can be extended freely, but, when flexion is attempted, this movement is not perfect—the limb rolls outward a little. The child complains of fatigue towards evening, though she sleeps well, with the exception of occasional moaning. Circumference of the two thighs at upper and middle thirds is the same, but at lower third that of right is one-fourth inch less; calf and ankle are now one-half inch small, while the foot is one-fourth inch short. *Hip disease* is diagnosticated now, and treatment begun therefor. The condition on June 27 is less like hip disease than at last visit. The child has been resting well at night; motion at joint is good—almost perfect.

July 30. Patient lies on back this morning, as requested, and voluntarily flexes thigh through the normal arc. The notes to Sept. 1 indicate an almost complete subsidence of disease, but on this date a slight degree of fulness is observed at the insertion of the tensor vaginæ femoris, the limb at this point being one-half inch larger than the other. Motion is limited in complete extension, not otherwise. A periostitis immediately suggests itself, and the resistance to extension is easily explained.

Sept. 22. Motion at joint not so free as on the 1st. The disease is still regarded, however, as one of periostitis.

It can be readily seen how a paralysis affecting a single group of muscles may give rise to signs almost pathognomonic of hip disease. The case just reported gave a history, it is true, very much like that of infantile paralysis, though not a typical history, and “type cases” are so rare that I was easily led into error by remembering this fact, and by the trophic changes so early observed. Still the child was beyond the age at which the majority of spinal paralyses occur, and this fact should have commanded more respect. Furthermore, the preservation of faradic irritability could just as well, according to some recent observations, exclude incipient arthropathy as spinal paralysis.

V. Spinal Arthropathy affecting the Hip-joint as differentiated from Hip-disease.

True and false arthropathies of spinal origin may likewise be interpreted as true joint disease, though the hip is not so often the seat of these neuroses as are the knee and ankle joints. Still, in my experience, the hip has been sufficiently affected to cause some errors in diagnosis, and the following case is presented as illustrative:—

CASE XI.—A strumous-looking female child, æt. 10 years, admitted to hospital April 21, 1876. The family history is imperfectly obtained, as no other members are present at date of admission, the child coming from an orphan asylum. A history of the exanthemata is obtained however, and of a fall from a bed six or eight weeks prior to this date, and the appearance of signs pointing to some lesion about the hip two weeks thereafter. This, taken in connection with her general appearance, a marked

lameness typical of hip-disease, the position of the right limb in standing, viz., in semiflexion, eversion, and rotation outward; a flattening of the nates, tenderness on pressure thereabout amounting to a hyperæsthesia; resistance to flexion beyond 90° , to extension beyond 160° ; a swelling near the crest of the ilium; an absence of real shortening, while there is an apparent shortening—the above history, I say, taken in connection with all these signs, positive and negative, leads to a diagnosis of hip-disease second stage; though, on reflection, it occurs to us that such an amount of hyperæsthesia cannot be due to disease in the hip-joint, and that such deformity has come on too soon for true joint disease, and hence we placed an interrogation point after the diagnosis already recorded. The treatment to be expectant.

May 9. A distinct and well-marked fulness over crest of right ilium, from anterior superior spinous process to sacro-iliac junction, quite tender to pressure. The hip-joint seems free of any trouble.

12th. Fulness slowly increasing, a fly blister is applied this evening, the usual poulticing to follow.

16th. A bed this forenoon, but this afternoon moves about the ward with great difficulty by aid of a chair, the foot being raised some two inches from the floor. The symptoms gradually subsided, and with the exception of a pain in the lumbar region at times, nothing occurred until August 17, when the fulness seemed to have shifted from the ilium to the thigh, and the upper fourth of this member measured one inch more in circumference than the left. There accompanied this heat tenderness and constitutional disturbance generally. A cathartic, evaporating lotion, and rest seemed to afford relief by the 26th, though the fulness remained. With a few intervening notes of minor importance, it is noted on September 28, that the child stands with both limbs parallel, and scarcely a limp can be detected in her gait. The changes subsequent to this depended on the amount of exercise, and the treatment was purely expectant. At times, she was in great pain, unable to leave her bed, and the parts around the hip were exquisitely sensitive, then relief would come and she would get almost well.

May 29, 1877. In one of these attacks there is discovered marked tenderness over and to either side of the spinous processes from the fifth dorsal vertebra to the sacrum. The spine is thoroughly blistered and poulticed, with decided benefit. Subsequently, ergot was administered, and by July 20 there is no pain or lameness or other sign of disease. She is kept under daily observation until October 5, up to which time not an untoward symptom has recurred, and now she is discharged cured; no muscular rigidity, no tenderness—spinal or femoral—and no lameness whatever existing.

Further cases may be found detailed in a paper read by the author at the session of the American Neurological Association in June, 1877, entitled, "Spinal Irritation in Children as related to True and False Arthropathies." The paper is in the Transactions of the Association for that year. A case presented January 4, of present year, with very prominent signs of disease at the hip-joint, but the gait of the child alone saved us from committing an error in diagnosis. Talipes equinus of cerebral origin was made out, and this proved to be one of the prodromata of a tubercular meningitis. The case is so interesting that I am strongly

tempted to report it in this connection, but already my paper is becoming unwieldy on account of its length.

While on this subject of neuroses, I take occasion to refer to cases of intestinal irritation from *Ascaris lumbricoides*, which presented almost complete pictures of hip-disease.

VI. *Caries of the Lumbar Vertebrae in the first stage, or in the advanced stages, often simulates Hip-disease.* As illustrations the following—

CASE XII.—January 28, 1877, a Scotchwoman brought her boy, æt. $2\frac{1}{2}$ years, into the office for examination. The little fellow was plump and hearty-looking, but exceedingly cross, and a thorough examination was very difficult; still, it was observed that he stood in a semi-stooped position, with right thigh advanced and knee a trifle flexed, that he walked with a kind of hop, the shoulders being elevated, that he stooped without bending the spinal column, the motion being made (and that cautiously, too) at the hips and knees, that in the dorsal decubitus complete extension of the right thigh could not be made without tilting the pelvis, while the other movements could be made easily and painlessly, that in prone position the spinous processes of the last dorsal and the first lumbar vertebrae seemed a little prominent, no tenderness on pressure or percussion being present. The history was that two weeks previously he was perfectly well and had been up to that time, that shortly thereafter he complained of an occasional pricking sensation in the right lower extremity, no febrile movement accompanying; that for a week he had been restless at nights, complaining of pain when handled, and had been lying across the mother's lap for ease. The father was rheumatic, the mother healthy, so reported.

A diagnosis of caries of the spine was made, the contraction of the thigh flexors being accounted for by the relationship between the seat of lesion and the origin of the muscles in question. Measure taken for a brace.

February 14. Fulness over crest of right ilium this morning with an elevation of temperature, as shown by the thermoscope. Contraction of psoas so great that thigh cannot be extended beyond 130° . Fly blister to region of fulness.

29th. Thigh held flexed at an angle of 90° ; fulness over crest still a prominent feature. A more thorough examination is made and negative points noted, but transcription here unnecessary.

March 18. Little change as yet, and as the boy is recently complaining of abdominal pains the spinal brace is applied, and, at the same time, a gentle counter-irritant is ordered to the spine.

June 23. A mere trace of contraction of psoas remains, the boy stands with limbs straight and walks with a very slight limp. With a few unimportant changes he did well, and his condition, as recorded August 16, is that his health is apparently excellent; right thigh advanced a little, but extensible to extreme limit with moderate force, a distinct incurvation of spine, from the tenth dorsal to the third lumbar, with a shade of fulness over sacrum. The mother has unadvisedly left off the brace a few nights and the boy seems to have suffered from this as an effect.

Sept. 5. Caries of lumbar spine indubitable, as a prominence is perceptible.

Nov. 13. Induration and swelling in the right groin, the ganglia here being infiltrated. Circumference of the thigh, upper fourth, one inch greater than its fellow.

16th. Case seen by a well-known clinical professor, who has no difficulty in making a correct diagnosis, but requests the privilege of bringing the boy before his class in order to illustrate the points in differential diagnosis between the second stage of morbus coxarius and femoral abscess of spinal origin. The subsequent history bears only on the progress of the case, and, in brief, is simply the formation of a large residual abscess, opened by aspiration May 18, 1877; relief in due time; an almost perfect recovery by the close of July, and death from malignant scarlatina August 3, with no opportunity for an autopsy.

A physician is called in sometimes to see a child with a swelling about the hip; this is examined superficially on account of the prominent signs; a history is sought; the *fall* is described, and his diagnosis is unhesitatingly made without having his attention drawn to the spinal column. To my own knowledge this has occurred time and again. As an instance the following:—

CASE XIII.—In the early part of January of present year a mother called to report her child, an out-patient of the hospital, as unable to attend, so helpless had he become by reason of the progress of the disease. She mentioned the name of her family physician, whom I knew to be thoroughly competent, from his surgical experience in some of the best hospitals in the city, to take charge of any case, and to him I referred this patient, a boy, æt. 11 years, under our treatment since March 5, 1874, for caries of the lower dorsal. When I last saw the boy in August, 1877, there was a circumscribed tumour over the left hip, and I recognized this as a spinal abscess, ordering appropriate treatment therefor. I instructed the mother to ask the physician to whom I had just referred the case, to notify me as to present condition.

Jan. 17. I was informed by letter that the child with caries of the spine had also hip-joint disease of over a year's standing, received from a fall; that the leg was flexed somewhat upon the thigh, and the thigh upon the abdomen, the usual position of the limb. I immediately requested a consultation, but the Doctor was called out of town, and left word for me to examine at my convenience.

30th. I made a careful examination, and found a marked angular deformity of the spine, a soft, fluctuating tumour over upper and outer aspect of thigh, measuring three inches vertically, and an inch and a half transversely. The circumference of the limb at every point save over this tumour was identical with that of the other limb; there was no shortening whatever, and the thigh could be moved in every direction without any pain in the hip or at the knee; but when complete extension was made, the skin covering the tumour was put on stretch, and the boy complained of pain here. Rotation was easily accomplished, and I could find no disease at the hip by any of the recognized signs. In the absence of shortening, atrophy, and muscular contractions about the hip limiting motion, and in view of the position of the limb, I could not make out any hip-joint disease, and so reported to my friend the physician.

VII. *Extra-capsular Abscess may be so situated, and so Chronic in Character, that a Differential Diagnosis from Hip-disease becomes very difficult.*

Muscular function may be impeded by abscess having no connection with the joint; the limb may become distorted, and errors in diagnosis may easily occur. A child in robust health may get a contusion, and from this a circumscribed cellulitis may arise, and suppuration may result; or a child, in a low condition of health, may get what is termed a "cold abscess" in the neighbourhood of the hip, and this may last indefinitely.

CASE XIV.—Female, æt. 3 years, to all appearances well nourished, was admitted to the hospital December 14, 1875. The father and mother gave good family histories, while the child herself was reported as having enjoyed peculiar immunity from the diseases of infancy. Began to walk lame one year prior to admission, and no cause could be assigned. This was the only sign observed until within the last few weeks, when pain was complained of in the back, and this pain was increased by any jar or turning. The child was restless and wakeful at night. About one month ago a plaster of Paris jacket was applied by a physician for suspected spinal disease. This proved very uncomfortable, and, failing to give support to which the child could accustom itself, was removed by the mother, without consulting the physician, at the end of two weeks, when a swelling was observed over the left hip.

This morning the child stands with left limb advanced, toes slightly inverted, and walks quite lame. The spinal column presents no deviation laterally or antero-posteriorly, and no tenderness on pressure, percussion, or concussion. The left nates is broader than its fellow, fold elongated. Above the trochanter, and extending from the same to the crest of the ilium, is a circumscribed fulness, elastic to the touch, non-fluctuating, and painless on pressure. Thigh can be flexed to an angle of 90° without pain, and can be completely extended, though there is muscular resistance to complete abduction. There is no shortening, no atrophy of the limb, and no tenderness can be elicited at the sacro-iliac juncture. The diagnosis is not positive, although hip-disease suspected. Treatment expectant, a compress with the roller being applied over the tumour for the present.

Jun. 25, 1876. The gluteal tumour is perceptibly smaller, and the child walks with more ease.

28th. Nurse reports that the patient complains of pain along the spine, but a thorough examination to-day is attended with negative results.

March 28. The tumour has extended below the gluteal fold; general health very good.

April 16. Immediately to the left of the sacro-iliac synchondrosis is a hardish movable tumour, the size of a half-walnut; over the upper extremity of the thigh on a line with the fold of nates is a tumour larger in size, fluctuating, and painless.

May 20. Both tumours have increased in size, and the veins thereover are prominent.

June 16. Incision at most dependent portion gives exit to about one pint of pus, of fair consistence.

28th. Constitutional disturbance only within past three days, and patient now very feeble and indisposed to eat or make any exertion. The discharge has been very profuse and offensive. Brandy and tonics given

freely, while the usual disinfecting injections are used. The notes from this time forward show a steady decline; emaciation became extreme, and all efforts, nutrient and stimulant, proved unavailing. Finally an exhaustive diarrhœa set in; this was followed by a dysentery, and on August 23, five days after the diarrhœa began, the patient died by asthenia.

An examination, *post-mortem*, revealed the sac of an abscess about eight inches long by four wide, lying between the glutei muscles, and a careful search failed most signally to detect any connection with diseased bone. The hip-joint, the sacro-iliac joint, and the dorso-lumbar vertebrae were carefully examined and found to be absolutely free from disease.

The locality of this abscess enhances the interest of the case, in view of the presumptive evidence at different periods of lumbar caries, sacro-iliac disease, and hip disease.

A suppurative inflammation of the lymphatic ganglia in the inguinal region may give rise to signs which, under certain circumstances, could baffle the skill of a very clever diagnostician.

CASE XV.—Female, æt. 5 years, admitted to the hospital July 24, 1876. A history of the exanthemata was obtained with very clear signs of sequelæ, unless the appearance of present ailment, in April, could be construed into a sequel of a diphtheria (?) which occurred in the month of December preceding. The father and mother seemed healthy, and no cause, either predisposing or exciting, could be assigned for present train of symptoms. In April, as just intimated, a swelling appeared in left groin, and a lameness was observed about the same time. This was all that was learned from the mother.

The child on admission is anæmic, stands with left limb a little advanced, and walks favouring this limb. In the dorsal decubitus, the spinous processes on a horizontal plane, the popliteal space cannot be brought nearer than three inches to the floor; flexion can be made over normal arc, and ab- and adduction easily accomplished. The thigh is one-half inch smaller than its fellow. In the left groin, about midway of Poupart's ligament, is an indolent ulcer three-quarters of an inch long by one inch wide, edges smooth; one inch below this is a still smaller ulcer, in the bottom of which is a little pus. Suppurative lymphadenitis diagnosed, and the treatment consisted of simple dressings, an alterative tonic, with cod-liver oil.

These ulcers proved very obstinate, and did not thoroughly heal until the following March. She did not gain sufficient strength, however, to warrant her removal from treatment; but on April 27, five weeks after the closing of the ulcers, the child was discharged cured, there being no halt whatever in her gait.

VIII. *Perinephritis in Children gives rise to Signs often Diagnostic of Hip-disease.*

About one year ago I published in this Journal three cases of perinephritis, and in the *American Journal of Obstetrics and Diseases of Women and Children*, the year before, nine cases, and in many of these the symptoms and signs so clearly resembled those of the disease now under consideration that I could not refrain from dwelling at some length on this very subject. Since my last publication, four or five new cases have been

under observation at the hospital, and from that number I select the following by way of illustration.

CASE XVI.—May 10, 1877, a mother brought her boy, *at.* 12 years, into the office for treatment, and he was admitted to the hospital the same day. With the exception of one or two of the diseases of infancy he had enjoyed good health. The father had been a drunkard, and had died phthisical; a paternal aunt had died of hip-disease; the mother gave a rheumatic history. The disease for which the boy is now admitted was first manifest six weeks ago, supposably originating in a “cold.” Loss of flesh had been marked, and his appearance to-day is indicative of much recent suffering. Pulse 116, R. 28, T. $101\frac{3}{4}^{\circ}$. He stands with body inclined to the right, the lower extremity of this side slightly flexed at hip and knee. The spinal column deviates to the same side, though there is no tenderness along the column, no angular curvature, no pain on per- or concussion; the nates is broadened. Lameness is marked, and very like to that of a patient with hip-disease, second stage. The thigh cannot be extended beyond an angle of 165° without pain, but can be flexed and rotated over normal arcs. Measurements of the two limbs identical. He complains of pain about the knee. In the left lumbar region the erector-spinal muscle is full and tense, giving quite a ridge-like prominence; yet there is no pain here, or in the right ilio-costal space; two and one-half inches from the spinous processes of the vertebræ there is marked tenderness, which extends to the right in a horizontal plane to a point immediately above the anterior superior spinous process, where the tenderness becomes more extensive in area. This area is triangular, extending along Poupart’s ligament. There is subintegumentary induration along and above the ligament, with extra heat and comparative dulness. Flexion of thigh relieves pain. There is and has been no intestinal derangement. Suffice it to say, we had no difficulty in diagnosing a perinephritis. The progress of the case differed from usual type. Suppuration came on in due time, a large abscess being opened just above Poupart’s ligament.

June 15. The sac was washed out with a solution of carbolic acid twice daily, and by July 10 the wound had about closed, and the boy was nearly well. A relapse occurred at this time, the sac filled again, and the boy became very lame.

July 28. The pus has burrowed beneath the superficial abdominal fascia, from pelvis to lumbar spine, and hectic is marked. The medication thus far had been the tincture of the chloride of iron and chlorate of potassa, with stimulants, *p. r. n.*

Aug. 4. All acute symptoms have subsided; the discharge is simply an oozing, and the patient otherwise might be considered as cured.

9th. Wound entirely closed.

24th. Boy fat and hearty; active in body and limb; walks and runs without any lameness; cured.

IX. *Rheumatism of the Hip-joint as differing from Hip-disease.*

A monarticular rheumatism affecting the hip is not of common occurrence in children, and hence we are not often called upon to exclude this in making up a diagnosis. Still cases do occur, and with more frequency probably than we are willing to admit. There is good reason for supposing that many of those cases of hip-disease wherein a cure has taken place in the second stage have been nothing more than a chronic monarticular

rheumatism. While I have seen a few cases undoubtedly rheumatic in nature, I have not kept full notes throughout the various stages; but the following case, which came under observation in the out-door department, may serve as an illustration:—

CASE XVII.—Female, æt. 17 years. March 27, 1876. Hearty and robust; walks very lame, though with comparative ease. Left hip ankylosed at an angle of 125° , being in strong adduction as well as flexion. There is much lordosis; the limb is shortened nearly $1\frac{1}{2}$ inches, apparently 4 inches. No swelling, pain, or tenderness. Atrophy of thigh 3 inches, of calf $\frac{1}{2}$ inch. Patient had scarlatina when three years of age, and one year later the disease which has left her deformed first made its appearance. She had much pain at first; was confined to bed a long time; never had any abscess, or any sign of one. A brother, æt. 9, had just been in the hospital for chronic rheumatic arthritis of the knee, with pains about the hip. Knee swelled at time of admission, and lesion was located in this joint. One month later the right ankle became painful and swelled. This soon subsided, and five weeks later the right shoulder was affected, and recovered in one month.

I cite this boy's case as suggestive at least of a rheumatic diathesis in the family, and as evidence that the case of his sister is one of rheumatism.

X. *Does Malaria affect the Hip-joint or Surroundings, causing Signs and Symptoms of Hip-disease?*

It is a fact that physicians who practise in malarial districts often meet with patients presenting many of the signs of hip-disease; that they put these same patients on full doses of quinia, and all other signs of arthropathy disappear.

The case I am now to report was referred to the hospital by Dr. McIlroy, of this city.

CASE XVIII.—Female, one year and two months of age, seen February 20, 1877. The child seemed fairly nourished, though that which seemed the most prominent sign was its refusal to put the left foot to the floor, when held up. The limb is semiflexed at the hip and knee, and rotated outwards; nates flattened, though no fulness here, and no other evidence of effusion; head of thigh-bone rotated with ease, though when complete extension was attempted there was resistance on the part of the psoas and iliacus, and the adductors were moderately tense as well. The limb was held with exceeding care by the little patient. Rectal temperature 101° . The child very cross and the mother very silly, hence a thoroughly satisfactory examination impracticable.

A history of "a cold in the head" for two weeks, accompanied during the past four days with an intermittent fever, so far as can be learned from the mother's description. Had a fall from a chair on the 2d inst., striking on the back, no immediate injury being observed. Just began walking on the 8th, and eight days later refused to walk, the intermittent fever coming on at this time. The parents lived in the upper part of New York, beyond the Harlem River—a locality abounding in malaria. The diagnosis was obscure, and I wrote Dr. McIlroy a note advising the use of quinia in full doses, thinking, at least, that at the next visit the symptoms would be much clearer.

March 5. Dr. M. has been giving quinia daily since last visit, with the effect of ameliorating the malarial element. This morning there is decided induration around the lower third of the femur, with contraction of the leg-flexors; three-fourths inch larger than fellow. A brace is applied to overcome the contraction.

April 6. Mother calls this morning bringing child in one hand and the brace in the other. She calls to report a cure and return the brace. The child walks well, and has no pain. Examination fails to detect anything save a crackling sensation when passive motion is made at the knee, and this seems due to a dryness of the synovial membrane. No difference in size, no pain of any kind. Fourteen days ago the intermittent fever was broken up, and all the joint signs disappeared with this. Dr. M. writes me recently that to his knowledge no relapse has ever occurred.

It will be seen from a careful study of the cases herein recorded that no one sign or symptom is pathognomonic of hip-disease.

It is difficult to lay down rules by which a diagnosis can always be easily made. I know of no better method than a thorough examination of the patient, testing the functions of the limbs, being at the same time familiar with the normal functions. The history must, of course, be as accurately obtained as possible; and, if a slow insidious beginning can be distinctly traced, then the evidence becomes strong. Frequent observation must be made when there is room for doubt. I believe it well that cases wherein much doubt exists should be treated as hip-disease until the signs are sufficiently clear to make a diagnosis. The child should have the benefit of the doubt.

ARTICLE VIII.

SYPHILIS OF THE CONJUNCTIVA. By CHARLES STEDMAN BULL, A.M., M.D.,
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SYPHILITIC lesions of the conjunctiva, existing independently, and not connected with lesions of the eyelids on the one hand, or of the eyeball on the other, are not common. The connection between the palpebral conjunctiva and the other structures of the eyelids is so intricate, that syphilitic infiltration of the lid, be it circumscribed or diffuse, soon involves the mucous membrane. The same may be said, in a modified sense, of the connection between the ocular conjunctiva and the underlying fibrous capsule of the eyeball.

In syphilitic patients we not unfrequently meet with an obstinate conjunctival inflammation of the catarrhal type, without there being any certainty that the conjunctivitis is caused by the syphilis. This is especially noticeable in some cases of obstinate iritis.

The older authors were very apt to confound syphilitic lesions of the conjunctiva with those of the lids, not recognizing any difference in their

course, or in their place of origin. Even Lawrence, who usually discriminated accurately, is not always clear upon this point. He admits that the mucous lining of the eyelids sometimes participates in the syphilitic eruptions which affect the general cutaneous surface, and is right in believing that this does not happen so often as we might have been led to expect from observing the correspondence in diseased action between the conjunctiva and the skin.

As a matter of clinical experience it may be stated that the syphilitic lesions of the conjunctiva are eruptions, ulcerations, and infiltrations. Under the head of ulceration are to be considered the chancre or initial lesion of syphilis, and secondary ulcers, resulting from the breaking down of infiltrated masses. All modern authorities agree in recognizing the occurrence of the initial lesion upon the conjunctiva, as well as gummy infiltrations and secondary ulceration. Mauthner and Bouchet both speak of the occurrence of soft chancres in the conjunctiva, but it is not quite clear what they mean by the term.

The initial lesion is rarely met with on the eyelids, and is a still rarer occurrence on the conjunctival surface alone. In most of the reported cases the ulcer has been on the margins of the lids, where cutaneous and conjunctival surfaces meet. Cullerier, Mackenzie, Lawrence, Ricord, Fournier, Martin, and others, all speak of chancres in this locality. According to Sturgis, in his report of 1646 tabulated cases of chancre, the ulcer occurred only six times on the eyelid. But in some of the cases reported, the ulcer was purely a conjunctival lesion. Desmarres (*Maladies des Yeux*, ii., p. 213) mentions a case of chancre of the conjunctiva, occurring in a woman, near the inner canthus, and occupying the entire thickness of the upper lid. The ulcer was deep, with sharp edges, its bottom was covered by a gray pultaceous matter, and there was engorgement of the neighbouring lymphatic glands. Seven weeks later appeared a general papular syphilide. The ulcer healed on the sixtieth day.

Mauthner quotes another case of Desmarres, in which, in the middle of the inferior conjunctival cul-de-sac, there was an oval tumour as large as a pea, firmly connected with the mucous membrane, with ulcerated surface, and eroded walls, and enlarged preauricular gland. The diagnosis of chancre was confirmed by Ricord. Mauthner also saw in a girl, in the conjunctiva of the left lower lid, an ovoid, smooth tumour, with ulcerating surface, and irregular edges, but no swelling of the neighbouring glands. A diagnosis was made of the chancre, and the tumour was removed by the knife. It returned in the scar, and was again removed, but the eye was injured. Traumatic choroiditis ensued, caused sympathetic irritation in the other eye, and the eye was consequently enucleated. There were never any constitutional symptoms of disease, and the diagnosis is therefore extremely doubtful.

Galezowski (*Journal d'Ophthalmologie*, 1872) reports a case of primary

chancre of the palpebral conjunctiva. In the upper lid, near the internal canthus, could be seen a swelling as large as a hazelnut, which could be felt through the skin. The lid could not be everted; but by drawing it forcibly away from the eyeball there was seen an ulcerating surface which reached to the cul-de-sac, and suppurated slightly. The sore healed by mercurial treatment, but left behind an extensive symblepharon. It is not stated whether the patient had previously manifested any symptoms of constitutional syphilis, nor whether any appeared at a later period, and it is therefore not certain that this was the initial lesion. The symptoms would answer for a disintegrated gummy infiltration, or for an ulcerating tubercular syphilide.

Sturgis reports still another case of conjunctival chancre in the *American Journal of Medical Sciences*, January, 1873, occurring in a child, æt. 22 months. The lower lid was swollen and inflamed, and on everting it there was seen near the outer canthus a dusky-red papule, which speedily changed into an ulcer, with clean, red granulating surface. It was not indurated at first, and the neighbouring glands were not examined. One month later the child had a febrile attack, during which an eruption appeared upon his abdomen and chest. Sturgis first saw the child two months after the appearance of the lid-swelling, and then the induration was marked. The ulcer was still granulating, and there was a general roseola in the stage of decline, and mucous patches in the mouth. The mode of origin in this case was never discovered.

Bumstead reports a case of initial lesion occurring on the internal surface of the upper lid. (*Treatise on Venereal Diseases*, 3d edit.)

Dietlen mentions a case of chancre of the conjunctiva occurring in the left eye of a physician three or four weeks after he had examined a woman affected with syphilitic condylomata. At the end of six weeks there appeared a general roseola and infiltration of the parotid and submaxillary glands. The lesion was situated in the cul-de-sac, where there was marked induration, and the ulcer slowly healed, leaving a sclerosed cicatrix. (*Thèse d'Erlangen*, 1876. *Révue des Sciences Médicales*, April 15, 1878.)

Galezowski further refers to five cases of indurated chancre, existing on the palpebral edge of the lid, all inoculated upon the mucous membrane, the skin not being involved until later. He does not regard the engorgement of the preauricular and submaxillary glands as pathognomonic of syphilis. On the other hand almost all authorities, and especially Lance-reaux, estimate the importance of this sign as great.

The writer of this paper has during the past year had an opportunity of seeing and treating a chancre of the conjunctiva which tended to extend in an unusual direction.

The patient was a young man, æt. 29, who had never had any symptom of venereal disease according to his own statement, and who showed no physical signs of any preceding lesion upon his body. There was no

history of any contamination, so that the mode of origin of the ulcer is unknown. The lower lid became somewhat inflamed, swollen, and painful about a week before I saw him, and there was some little muco-purulent discharge, which collected along the edges of the lids and on the cilia. On everting the lid, deep in the cul-de-sac, about a quarter of an inch from the external canthus, was an ulcerated surface, covered by a grayish, pultaceous matter, with hard base, the induration extending for some distance on every side. The ulcer was irregularly oval, about half an inch in its longest diameter, and extended upwards into the ocular conjunctiva, which was very much thickened. The whole conjunctiva, both ocular and palpebral, was intensely congested, giving the appearance of an aggravated conjunctivitis. The preauricular gland of the corresponding side was enlarged and tender, and later the same symptoms appeared in the parotid and submaxillary glands. A diagnosis of chancre was made, the ulcer was cauterized, and the patient placed immediately upon anti-syphilitic treatment. The sore pursued the usual course, healed in about three weeks, and the engorgement of the glands gradually subsided. About nine weeks after the occurrence of the ulcer there appeared a roseola upon the face and hands, which soon became general. Some weeks later the patient complained of his mouth, and on examination showed several mucous patches on the buccal mucous membrane, and one on the side of the tongue. Any lingering doubt as to the ulcer having been the initial lesion was now set at rest. The patient subsequently suffered from an attack of monocular iritis.

There seems to be very little doubt that either the ciliary margin of the lids or the cul-de-sac is the part most frequently the seat of the conjunctival chancre. There are some rare cases reported where the lesion was in the ocular conjunctiva at the edge of the cornea, but the references to these cases which I have been able to consult were so slight that the diagnosis needs confirmation. They may have been ulcerated gummy deposits, or even non-specific ulcers.

The secondary lesions of the conjunctiva, those occurring during the period of constitutional infection, are much more frequent than the initial lesion. Lancereaux describes them as small circumscribed spots, elevated, non-vascular, and of a reddish-gray or coppery colour, not differing much from certain eruptions on the skin with which they may coexist. Galezowski affirms broadly that syphilitic affections of the conjunctiva are either chancres or mucous patches. Again, Desmarres says that he has never seen any mucous patches or coppery eruptions on the conjunctiva. But the mucous patch is certainly not the only lesion found at this period in the conjunctiva, for papules and pustules are not rarely seen here, accompanying other signs of constitutional syphilis. Thus, Lawrence (*A Treatise on the Venereal Diseases of the Eye*, London, 1830) reports a case of syphilitic iritis with a general papular eruption, in which there were a few pustules on the mucous membrane of the lids, appearing as small yellow points the size of a large pin's head. In another case of general papular eruption, there were found several yellow pustules in the palpebral conjunctiva, which caused a great deal of "uneasiness and

swelling of the lids." In still another case, where the eruption was tubercular, chiefly affecting the face and tibiae, the upper lid of one eye became swollen; and on everting it, an eruption of small pustules was observed upon the conjunctival surface. In a fourth case, with ulcers in several parts of the body and periosteal nodes, Lawrence observed that the left upper lid was red and swollen, and on everting it he discovered on the inner surface a sore as large as a sixpence, with a tawny surface which did not extend as far as the ciliary margin of the lid.

These sores with tawny surfaces are not very uncommon, and are probably ulcerated mucous patches. I have seen several within a comparatively recent period, and will cite one case in detail as showing how a mucous patch or condyloma on the conjunctiva grows.

The patient was a young man, æt. 22, whom I saw for the first time on October 11th, 1877. The chancre had been contracted about four months previously, and he had sore throat and a general eruption, probably a roseola, before I saw him. At the above-mentioned date, he presented himself with an iritis of the left eye and a general papular eruption. Two days later, he noticed that the upper lid of the left eye was somewhat swollen and tender to the touch. On everting it, there was seen an elevation of the conjunctiva over the centre of the lid, something like a small vesicle, as if there had been an effusion beneath it, and a localized engorgement of the vessels. The next day, this elevation had extended and was more resistant to the touch, as if the effusion were not fluid. The vascular injection was also more marked. The extension continued steadily until, on the sixth day, the signs of a mucous patch were unmistakable. It was oval in shape, somewhat more than half an inch long, its long diameter corresponding with the long diameter of the lid, and it did not reach the ciliary margin of the lid. It had the reddish-gray colour and moist surface which we are all accustomed to see. This surface subsequently ulcerated, became very red and painful; the ulcer extended superficially, and had an offensive discharge. It eventually healed, though for a time it resisted treatment obstinately, and the resulting cicatrix produced a slight entropium of the inner lip of the ciliary margin of the lid.

It is a well-recognized fact that mucous patches ulcerate easily, and it is not improbable that some of the reported cases of soft chancre of the conjunctiva are ulcerated mucous patches. There is such a case published in the *Gazette des Hôpitaux*, No. 11, Jan. 27th, 1866.

A woman, æt. 22, had mucous patches on the vulva and labia majora. The lower lid was red and painful at the external canthus, and the ocular conjunctiva was injected. There was no lachrymation and no secretion of any kind. The ocular conjunctiva became chemotic, and the eye could not be opened, owing to the increased swelling of the lids. Four days later, the swelling had subsided somewhat, and on everting the upper lid there was seen near the canthus an elevation of the mucous membrane of a deep red colour, the size of a small pea, with ulcerated surface. The cornea was healthy, but the ocular conjunctiva was deep red and lay in folds as far as the cul-de-sac. The case was well advanced towards recovery on the fourth day after the treatment began, and its site later could only be recognized by the deep red tinge of the conjunctiva, which remained.

Though ulcerations of the conjunctiva usually occur with other syphilitic

ulcers on different parts of the body, yet, as before observed, they result from the disintegration of gummy infiltration as a rule, and not from mucous patches. Yet, gummy tumours do not always precede syphilitic ulceration. In isolated cases, the process begins with infiltration of a portion of the conjunctiva, but quickly ulcerates and forms a conjunctival ulcer, which, according to Stellwag, is easily distinguished from the surrounding tissue by its fatty-looking coating, irregularly eroded edges, and uneven base. If properly treated, these ulcers generally cicatrize rapidly. According to Hirschler, if the ulcer was on or near the ciliary edge of the lid, the cicatrix itself is very characteristic. It appears as a tendinous white cord, entirely devoid of cilia, sharply defined, which extends through the entire thickness of the edge of the lid, and forms an excavation in consequence of its great shrinkage.

In the *British Medical Journal* for March 18th, 1865, there is a report of the proceedings of the Medical Section of the Manchester Royal Institution for February 1st of the same year, in which an account is given of a syphilitic ulceration of the palpebral conjunctiva, which is of somewhat doubtful origin. The margins of the lids were red and swollen, and on everting the upper lids, two small ulcers were seen on one, and one on the other. Each was slightly excavated, with yellowish base, and about the size of a split pea. They were all three in the palpebral conjunctiva, quite within the ciliary margin and not observable till the lids were entirely everted. In one of the patients there was a yellowish ulcer on the left tonsil, and some serpyiginous ulcers on the legs. Mr. Windsor, who reported the cases, regarded them as comparatively rare, and stated that they occurred in cases of the phagedenic form of ulceration. As the ulceration in these cases involved the tarsal cartilage, they probably belonged to the class of disintegrated gummata.

There is another point of interest in these superficial ulcers on the conjunctiva, and that is their isolated occurrence as a symptom of constitutional syphilis. The patient may have been free from all symptoms of disease for several years, when suddenly the conjunctival lesion makes its appearance, runs its course, is healed, and again the patient is free from all symptoms. Thus, Lawrence cites the case of a gentleman who had a large ulcer, with dirty whitish surface, on the conjunctiva of the upper lid of one eye, and who had had no other symptoms of syphilis for three or four years. The writer has himself seen a case of large superficial ulcer of the palpebral conjunctiva in a man who had had no sign of disease for more than two years. The sore healed under mercurial treatment, and no other lesion made its appearance during the observation of the case.

A third variety of conjunctival lesion in constitutional syphilis is the gummy infiltration, circumscribed and diffuse; and this is probably the least common of all. Gumma of the sclera, involving sometimes the

fibrous capsule of the eyeball, is not an uncommon late symptom of syphilis, but gumma of the conjunctiva is certainly rare. Late manifestations of syphilis, occurring in the tertiary period, are rarely limited to the conjunctiva, but usually beginning in other tissues, involve the mucous membrane by contiguity of structure. Under this head must probably be classed the case described by Tavignot (*Bulletin de Thérapeutique*, October, 1846), and referred to in Schmidt's *Jahrbuch*, Band lv., p. 217.

The patient was a man, æt. 44, who had had no sign of syphilis for twenty years. He presented himself with a tumour of the size of a bean upon the right upper lid. This was removed, but fifteen months later there appeared a number of small growths upon the palpebral conjunctiva of the same eye. In addition there were three small new tumours; the largest was on the left upper lid, appeared united with the cartilage, and was covered by a reddish, ulcerated skin; a second, about the same size, and more movable, was on the right upper lid; the skin over it was reddened, and, when the lid was everted, there was seen a small fistula at the site of the tumour, through which a fine probe could be passed for a distance of several millimetres. The third tumour was very small, and appeared at the external angle of the right upper lid. There were small ulcers at various spots in the conjunctiva, particularly near the ciliary margin. The syphilitic nature of the lesions was proved by a clear history of symptoms and the presence of numerous coppery blotches upon the patient. The ulcers and tumours of the lids healed under a course of mercury.

Lawrence (*loc. cit.*) cites an interesting case of inherited syphilis, in which an ulcer appeared on the palpebral conjunctiva, and spread superficially; but the case is not reported with sufficient care to enable us to decide whether the lesion was primarily an ulcer or a gummy infiltration.

The child was a boy, æt. 4, who was born healthy of a syphilitic mother, and the first sign of any trouble appeared when he was three years and four months old. Both eyes became inflamed with great pain and photophobia, but Lawrence does not say whether this was an attack of iritis or of something else. Two months later a general eruption appeared over the whole body, which disappeared under treatment. One month later the eruption broke out again, and the eyes became sore. An examination showed reddened and swollen upper lids in both eyes, and on everting the right upper lid, the mucous membrane was found very much swollen, and a large ulcer, with elevated margin and foul surface, extended the whole length of the lid, but did not reach the ciliary margin. The conjunctiva of the left upper lid was not ulcerated. The results of treatment are not given.

Magni has seen in syphilitic patients, after an iritis, the development of small, discrete tumours in the conjunctiva, varying in size from a pea to a bean, semi-globular in shape, with white summit and red base. Under the microscope they were found to consist of a mass of young cells lying in a granular matrix. He cites a case of what he calls "Kerato-conjunctivitis Gummosa" in the *Giornale d'Oftalmologia*, 1863, which is quoted in the *Annales d'Oculistique*, vol. li., p. 113.

The patient was a woman, æt. 44. Nothing very accurate was known of her previous history, but during the lactation of her second child, syphilitic ulcers appeared, it is not said where; and later cutaneous syphilides and iritis of the right eye. In January, 1863, when Magni saw her, the lids were oedematous; there was photophobia, lachrymation, and violent pain in both eyes. The palpebral conjunctiva was only slightly injected, but on the ocular conjunctiva there were seen semi-globular tumours, varying in size up to a large pea. With the exception of those situated close to the corneal margin, they were freely movable

with the conjunctiva. Other tumours soon formed, and the first grew larger. On the external margin of the cornea there were three small nodules, and the corneal epithelium was cloudy in the vicinity. The aqueous was turbid, there were posterior synechiæ, and vision was reduced to recognizing large objects. Some of these nodules were excised and examined microscopically, and showed the usual appearances of gummy infiltration. Under mercurial treatment all the nodules disappeared without ulceration.

Hirschberg speaks of what he calls "conjunctivitis gummosa," and describes three cases. They began as small growths, the size of a pea, which rapidly ulcerated. They had an infiltrated yellow base and eroded margins, and were accompanied by slight diffuse swelling of the conjunctiva. My knowledge of these cases is simply from reference, as I have not been able either to consult the original, or to find out exactly where they are published. The matter is also referred to in A. von Graefe's *Klinische Vortræge*, i.

The rare form of syphilitic conjunctival disease, called by Smee "conjunctival blotch," was probably of the same gummy nature.

Smee's case, reported in the *London Medical Gazette* for December 13. 1844. was a woman who had at first a small ulcer on the edge of the eyelid. She and her husband had suffered from syphilis for several years. There were numerous copper-coloured spots on various parts of the body, and later there appeared in the ocular conjunctiva, just below the cornea, a spot as large as a silver penny, raised above the surrounding surface, its colour coppery, but not opaque, and with no abnormal vascularity. The surrounding conjunctiva was œdematous. Smee regarded this eruption as analogous to purpura, and as distinct from the pustules of the conjunctiva sometimes found associated with a pustular syphilide. The eruption disappeared under the use of potass. iodide.

In *Guy's Hospital Reports* for 1861, p. 109, Mr. France speaks of "syphilitic blotch of the conjunctiva," and reports three cases. He describes it as a circumscribed and well-defined discoloration of the ocular conjunctiva *around the corneal margin*, which, within the affected area, is slightly thickened and raised, but not more vascular than the neighbouring surface. There is no disposition to ulceration, as when the margin of the lid is attacked by syphilis. The duration of the blotch, if not treated, is very protracted.

France's first case was a woman in whom the blotch occupied the entire lower half of the ocular conjunctiva of the right eye. His second case was a man, with a tubercular syphilide on the face, at the angles of the nose, and on the upper lip. On the conjunctiva of the right eye were three blotches, a large one at the nasal side of the cornea, and two smaller ones at the temporal side. The third case was in a boy, æt. 3, with inherited syphilis. Three weeks after birth the child was covered by an eruption, which disappeared after a month's treatment. Soon after a sanguineo-purulent discharge began in both eyes. He recovered from this in about two months, and remained well till eighteen months of age, when the whole body was again covered by an eruption, and then both eyes became affected by a partial and abruptly-defined discoloration and thickening of the conjunctiva around the corneæ.

Wecker's case of gummy tumour of the conjunctiva (*Traité des Maladies des Yeux*, 1867, i., p. 177) in some points resembles Smee's case.

His patient was a woman, æt. 38, in whom the growth was in the conjunctiva of the left eye, between the margin of the cornea and the insertion of the exter-

nal rectus muscle. The surface was ulcerated, and the tumour very painful. An attempt was made to remove it, but for some reason failed, and the pain was increased. When Wecker first saw the case he thought it was an epithelioma, but a careful examination revealed numerous coppery blotches upon the face, and an ulcerated tubercular syphilide upon the arm. Sichel, who also saw the case, called it certainly epithelioma. Under an antisiphilitic treatment the pain soon ceased, the tumour began to grow smaller, and at the end of two months the cure was complete, leaving only a slight cicatricial line along the corneal margin.

In the *Klinische Monatsblätter für Augenheilkunde*, Sept. 1870, Prof. Estlander reports a case of conjunctival gumma very like Wecker's case.

The patient, a young girl, æt. 19, who showed signs of tertiary syphilis, presented herself at the general hospital for treatment. While an inmate, with numerous syphilitic ulcers on various parts of the body, there developed at the external margin of the left cornea a flat and smooth tumour in the conjunctiva, with a horizontal diameter of about five (5 mm.) millimetres, and a vertical diameter of three (3 mm.) millimetres. In the centre of the growth the conjunctiva was gray, with beginning ulceration. This tumour disappeared in a week under mercurial inunction, leaving a deep gray scar. Potass. iodid. proved useless in the treatment.

Still another case of gummy tumour of the ocular conjunctiva is reported by Brière in the *Annales d'Oculistique*, 1874, tome lxxii., p. 105.

The patient, a man, æt. 25, had had the initial lesion four years before. Later came a papulo-tubercular syphilide, which lasted a long time. Then appeared exostoses on the clavicles, ribs, ulnæ, and tibiæ, with osteo-periostitis, so that for two years he had walked with crutches. He had intense cephalalgia, facial palsy, and had become silly from some lesion of the brain or meninges. There was also caries of the turbinated bones and vomer, and of the entire alveolar arch of the left superior maxilla. In August, 1874, there appeared a marked injection of the ocular conjunctiva of the right eye, with photophobia and lachrymation. The cornea and iris were not inflamed, and the media were clear; but on lifting the upper lid, and making the patient look down, there was seen at about (6 mm.) six millimetres from the corneal margin, between the external and superior rectus muscles, a tumour in the conjunctiva of a yellow colour and firm consistence, about the size of a large bean. Under antisiphilitic treatment this conjunctival growth diminished slowly, and after one month there was only seen a slight thickening of the conjunctiva at the point where the tumour had been.

The following case of gummy infiltration of the conjunctiva, with gummata of the sclera, was under my own care, and as the case is of considerable interest from its rarity, the history will be given in detail. The combination of constitutional syphilis with a certain group of symptoms that somewhat resembled scurvy, the general marasmus which subsequently set in, and finally the death from pneumonia, made a complicated case that was interesting to follow.

Louis B., æt 56, native of Canada, and by occupation a labourer, was admitted to Charity Hospital, Blackwell's Island, August 11, 1877. The patient is a tall, robust man, but prematurely aged in appearance.

Previous History.—Had always been a healthy man until the autumn of 1876, when he caught a severe cold, and was admitted to the hospital for simple bronchitis. At the end of ten days he was discharged cured, not having been confined to his bed for a single day. Remained well till the following summer, when he again caught cold and was readmitted to the hospital on August 11th. He had a dry cough, pain in the chest on

both sides running through to the back, an elevated temperature and accelerated pulse, with all the physical signs denoting acute pleurisy, with slight effusion on both sides.

Fifteen years ago he had had two attacks of gonorrhœa, with an interval of about six months between them. He positively denied ever having suffered from any symptom of syphilitic disease.

He was admitted to the ophthalmic ward of the hospital on August 16, 1877. He stated that two or three days before he had felt a sensation of soreness in the left eye, and on the following day in the right eye. The pain became dull, burning, and continuous, was located in the eye-balls, and was accompanied by lachrymation. Whenever he swallowed, whether fluids or solids, he felt a very severe pain in the eyes, and this was immediately followed by marked blepharospasm.

Nothing particular about the man's general appearance, except a pale, dull-yellow complexion and a look of hopeless wretchedness. An examination of the abdomen and back revealed the marks of an extensive old eruption, consisting of small white cicatrices with deep brown pigmented margins, irregularly arranged. These have been there for twenty years. Upon the hands and face there was a peculiar eruption, composed of elevated spots with flat tops, some round, others oval, yellowish-red in colour, with a narrow dark-red areola; neither painful nor tender to the touch, and presenting a mid-state between vesiculation and pustulation. On opening these, a thin, watery pus mixed with blood could be pressed out. These vesicles or pustules were scarcely large enough to be called bullæ, and yet there was conveyed to the mind a general idea of pemphigus. One of the largest pustules was on the left upper lid, and there were two smaller ones along its ciliary margin. There were several on the face, and the remains of a large one on the bridge and right side of the nose. On the hands the eruption was almost entirely on the dorsal surface, and was grouped around the knuckles and between the fingers. Some vesicles on being opened gave exit only to blood.

The eyes were almost identical in appearance. Surrounding the corneæ there was a growth, most marked on the outer and lower sides, varying in height from one and a half to two lines, seated in and beneath the ocular conjunctiva. This growth extended away from the cornea on all sides about one-third of an inch, was pale yellow in colour, moderately hard to the touch, with an irregular, knobby surface and apparently destitute of vessels. The conjunctiva was firmly adherent to this growth, and the cornea was imbedded in this wall like a watch-crystal in its frame. On being incised, it cut like brawn and the hemorrhage was very slight. Upon the sclera of each eye, between the tendons of the superior rectus and external rectus muscles, and partially covering the latter, was an extensive and extremely well-marked gummy infiltration of the sclera, very vascular, very tender to the touch, and especially painful when the eyes were turned outwards. This infiltration extended backwards symmetrically in the two eyes, but was somewhat more extensive in the right eye. The media were clear, and an ophthalmoscopic examination revealed nothing abnormal in the deeper tunics of the eyes. The patient's breath was fetid, the buccal mucous membrane very pale, and bore the marks of the teeth along the cheek. Tongue moist and thinly coated, appetite poor, bowels obstinately constipated. Temperature $100\frac{1}{4}$, pulse 102, intellect dull, answered questions very slowly. Physical signs of pneumonia well marked over both lungs.

A diagnosis was made of syphilitic pemphigus, gummy tumour of the sclera of both eyes, and pericorneal gummy infiltration of the conjunctiva, and double pleuro-pneumonia. The patient's condition was very bad, and a vigorous tonic and restorative treatment, combined with mercurial inunction and potass. iodide, was at once instituted. Quinia, dilute sulphuric acid, and iron were regularly administered. Potass. iodid. grs. xx ter die, and the inunction night and morning, and a liberal diet of milk, eggs, beef-tea, and eight ounces of whiskey daily.

The patient grew slowly worse, with occasional delirium, and in the intervals of delirium the stupor steadily deepening. Potass. iodidi grs. xxx three times daily. Diminution of conjunctival infiltration.

August 26. Integument dusky, breath very fetid, gums spongy and bleeding. Urine is turbid, sp. gr. 1015, contains a trace of albumen, some pus corpuscles, and a large number of triple phosphate crystals. Spots on the hands are growing larger, and approaching bullæ in appearance. Skin very dry and hot. A swelling has made its appearance over the inner condyle of the right arm, painful on pressure. This swelling soon extended down the right forearm, pitted on pressure, and was doughy to the touch; the right hand œdematous, also both legs and feet.

27th. Painful diarrhœa, attended by tenesmus, rumbling and bloody discharges; face puffy, repeated bleeding from the gums and nose. Patient is semi-comatose. Consolidation detected at apices of both lungs, with some friction sounds on the left side. *The scleral growths and the pericorneal conjunctival growths have almost entirely disappeared.* The spots on the hands and face are increasing in size, and becoming more red in colour.

29th. Diarrhœa ceased; mercury discontinued; transferred to pavilion on account of delirium. Right cheek swollen, especially near angle of mouth, and spots of ulceration on buccal surface opposite first molar tooth in upper jaw; right forearm swollen, red, hot, and tense.

31st. Right cheek swollen enormously; eruption decidedly hemorrhagic.

Sept. 3. Incisions in right forearm necessary to relieve tension; considerable pus discharged through the incisions; patient much relieved. Swelling of right cheek still more marked, and at one point on mucous surface a somewhat extensive black slough. *Eyes entirely well.*

6th. Constant delirium; slough in cheek extending; eruption drying up; arm doing very well; scarcely any febrile action.

16th. Large hole sloughed through the entire thickness of the cheek; delirium has turned to coma; steady improvement in the arm.

19th. Death at 4 P. M. in deep coma.

Autopsy, 20½ hours after death.—Body emaciated; on back of hands a number of bluish-red spots, varying in size from a three-cent piece to a dime. Beneath the right malar bone a round, clean-cut ulceration of all the tissues of the cheek, which extends to the angle of the mouth, but does not involve it. All the tissues involved in the ulceration form a soft, pulpy, brownish-red, offensive mass. Right half of tongue destroyed by ulceration; right half of inferior maxilla, from symphysis to angle, is denuded of periosteum and base, and same condition exists in the right superior maxilla.

Calvarium unusually thin; dura mater normal; increased amount of cerebro-spinal fluid; pia mater œdematous; sinuses empty; vessels at base of brain normal. At posterior portion of right hemisphere is a spot of softening about an inch in diameter, breaking down immediately on section.

Thoracic cavity contains about ten ounces of clear serous effusion; on right side a few bands of adhesion at apex; on left side a few bands of adhesion at base to diaphragm; upper lobe, central portion of middle lobe, and greater portion of lower lobe of *right lung* in stage of gray hepatization, associated with emphysema. In *left lung* entire lower lobe the seat of catarrhal pneumonia passing into gray stage; upper lobe emphysematous and oedematous.

Heart.—Both ventricles hypertrophied and dilated; on leaflets of aortic valves are soft vegetations; in pericardial cavity about half an ounce of clear serous effusion.

Abdomen.—Liver fatty; capsule of spleen thickened, and its parenchyma almost diffuent; in cortex of kidneys several small abscesses, size of a split pea; in both pyramidal and cortical portions are evidences of chronic interstitial nephritis. Pelves and ureters contain a small amount of pus.

Intestines are normal, except a few chronic ulcerations in the cæcum.

Situated in the median line of the neck, below and between the lateral lobes of the thyroid gland, is a tumour the size of an English walnut, just beneath the subcutaneous fascia; it is soft and fluctuating, and on section was found filled with disintegrated coagulæ. On the internal surface of its walls were a few calcareous plates. Pharynx and trachea normal.

The points of interest in the case are as follows:—

1st. The rarity of the pericorneal, conjunctival growth.

2d. Its coincidence with and yet independence of the gummy infiltration of the sclera.

3d. The cyst in the neck, with its disintegrated contents, unrecognized before death.

4th. The vesiculo-pustular eruption becoming pemphigoid and subsequently hemorrhagic.

5th. The hemorrhagic diathesis as shown in the various symptoms.

Of course, gummy infiltration of the sclera and episcleral tissue is a common enough manifestation of constitutional syphilis, and the scleral gummata in this case occupied the usual site; that is, in the neighbourhood of the external rectus muscle. Though the infiltration was extensive, this is not uncommon, and it extended in the usual direction from before backwards, towards and beyond the equator of the eyeball. Furthermore it was binocular and symmetrical, as is usually the case in syphilitic lesions of the eye. As regards the conjunctival gummata in this case, no ulceration occurred. Their appearance at first, and their mode of growth, resembled very much the description given by Smee of his case. They began as a dirty discoloration in small patches in the conjunctiva around the cornea, with at first scarcely any elevation. These patches then coalesced, gained in thickness and breadth, and thus formed the wall round the cornea. They then remained unchanged until the system came under the influence of the mercury, and then, in spite of the patient's generally depraved physical condition, they rapidly subsided and disappeared before the scleral infiltration was absorbed.

The conjunctiva and sclera were normal in appearance between this

circum-corneal wall and the gummy tumour of the sclera near the external rectus muscle. There was no increased vascularity of the eyeball, except in the immediate neighbourhood of the latter, and the absence of any continuity of abnormal growth between the two masses of infiltration was very clearly marked. The symmetrical arrangement of the double infiltration in the two eyes, and what might be called their symmetrical independence, was of considerable interest.

A third point of interest was the cyst in front of the trachea, the existence of which had not been recognized before death. This cyst had no connection with the thyroid body or trachea, and had probably existed for some time, perhaps years, if we may judge from the presence of the calcareous plates upon the inner surface of its walls. The exact pathology of the cyst it is very difficult to determine. There were no signs of interference in the functions of either trachea or œsophagus during life, so that its rate of growth is unknown. In view of the constitutional syphilis, its origin had been probably a gummy deposit in the subcutaneous tissue of the neck, just below the isthmus of the thyroid and in front of the trachea, which had subsequently undergone retrograde metamorphosis. Its contents found at the autopsy were regarded as disintegrated clots, but the presence of the blood may be accounted for by the marked hemorrhagic diathesis. The wall of the cyst varied from three to five lines in thickness; its inner surface was smooth, as if covered by a membrane, except where the calcareous plates were situated, and the outer surface rough, owing to adhesions to the surrounding tissues. Microscopic sections showed that there was no distinct lining membrane, nor any trace of epithelium, and the smooth appearance of the inner surface was probably the result of pressure of the contents. The wall was composed of a large number of layers of fibro-areolar tissue, with some cells, fusiform and round, with nucleus and granular contents. These layers of fibres were packed very closely together, forming a dense strong wall, which had probably originated in the following way: A gummy deposit had occurred in the subcutaneous areolar tissue, which, by its presence, had set up a localized inflammation, lymph was poured out around the gumma, became organized, and thus the growth went on. At some subsequent period the contents of the tumour began to break down, disintegrated and perhaps suppurated, and at this stage the hemorrhage may have occurred, and mingled with the contents. As the process of absorption went on, these bloody extravasations probably recurred again and again, and thus the cyst wall had no opportunity of collapsing, and hence no obliteration of the cavity occurred.

The accompanying eruption was another interesting feature in the case. Its ill-defined, nondescript character was at first unsatisfactory. The spots were as often pustules as vesicles, and even when more truly vesicular the surrounding areola was different from that usually seen in this variety of

eruption. Only in a few of the spots was the areola at all well marked, and the vesicles were not large enough to speak of them as bullæ until towards the close of life. The ill-defined character of the eruption was no doubt the sign of a lack of development, due to the extremely low, marasmic state of the man's system. As a rule patients with pemphigus die of marasmus, and very often from pulmonary tubercles or pneumonia. In many cases we also find at the autopsy amyloid degeneration of the liver, spleen, and kidneys, with chronic interstitial desquamative nephritis. The locality of the eruption was also somewhat singular. According to authorities, the favourite place for pemphigus is on the palm of the hand and sole of the foot, on the scalp and brow. But in this case the eruption was on the face below the forehead, and on the dorsum of the hands and fingers. The scars on the back and abdomen might point to either a papular or tubercular eruption. As a rule scars do not give any absolutely characteristic sign by which to recognize the preceding destructive process, though we are sometimes assisted by them in coming to a conclusion as to the nature of the lesion.

The final point of interest was the hemorrhagic diathesis, as shown by the tendency to bleed from mucous and cutaneous surfaces on slight provocation, and towards the end spontaneously. This was marked from the beginning. The buccal mucous membrane and tongue were pale and almost bloodless, and the patient had frequently had epistaxis. Subsequently his gums became spongy and bled easily; attacks of epistaxis occurred; a bloody diarrhœa made its appearance, and was with difficulty controlled, recurring again and again towards the end. The eruption became hemorrhagic, and even at first the contents of the vesicles or pustules was in part blood. As the vesicles became bullæ, the hemorrhagic tendency was still more clearly developed.

ARTICLE IX.

CAUSE AND PREVENTION OF SQUINT. By H. S. SCHELL, M.D., Surgeon to Wills [Ophthalmic] Hospital, and Ophthalmic Surgeon to St. Mary's Hospital, Philadelphia.

THE operation for convergent strabismus has, as far as its final results are concerned, never been absolutely satisfactory. There are several circumstances which may justify this reservation, either from a cosmetic or a physiological point of view. In the first place it is not always easy to obtain a perfect parallelism of the optic axes; the tendency being to do either too much or too little in the way of tenotomy. If, however, the

rectification be exact, there is generally left a disagreeable, staring appearance about the eye, owing to a sinking of the lachrymal caruncle. This latter effect depends upon a contraction of the subconjunctival cellular tissue, resulting from its disturbance by the hook used in searching for the tendon, and is obviously not easy to avoid. But even supposing that the appearance of the eye after the operation is everything that could be desired, there yet remains the most unfortunate results of all, in that we seldom obtain binocular vision, and the squinting eye is for the most part blind or nearly so.

In order to avoid the necessity for the operation, however, it becomes necessary to examine into the causes of strabismus. In the great majority of instances this defect is connected with, and apparently dependent upon the existence of hypermetropia, and to cases of this character it is proposed to confine the attention for the present. The manner in which hypermetropia acts in causing a predisposition to squint is probably as follows. It is well understood that in the ordinary act of vision there is a constant relation between accommodation and convergence. In emmetropic eyes, when observing distant objects, the optic axes are parallel and the ciliary muscles relaxed; but for near vision, the more the tension of the ciliary muscles is increased the more the internal recti contract, so as to bring both eyes to bear upon the same point. Now in hypermetropic eyes the ciliary muscles must be kept under some degree of tension even in viewing the distant horizon, and the internal recti have a tendency to contract accordingly. When such eyes are focused upon a near object the accommodation in use is equal to that required by emmetropic eyes for the same distance, plus the amount necessary to overcome the total hypermetropia. In like manner the effort at convergence would be equal to the effort at convergence for the same distance in emmetropia plus the effort which naturally accompanies the ciliary tension required to overcome the hypermetropia. Therefore, if the desire for distinct vision is greater than that for binocular vision, the tendency is constantly towards over-action of the internal recti and too great convergence of the optic axes—in other words, to convergent strabismus. This, however, mostly occurs in mean degrees of hypermetropia, because in high degrees it is impossible to obtain distinct vision with any effort. As vision with two eyes, however, has most obvious advantages over vision with one, the external recti are in most hypermetropes brought into play to counterbalance the excessive action of the interni; so that although a large proportion of the community are hypermetropes (especially in childhood when strabismus usually first makes its appearance), comparatively a small number acquire squint.

Badal reports that 20 per cent. of all the cases at his clinic are ametropic. Of these 30 per cent. have hypermetropia under one dioptric, 20 per cent. from 1 to 2 D, 12 per cent. from 2 to 3 D, and 5 per cent. from 3 to

4 D. Dr. Emil Emmert has examined the eyes of 2148 students of from 5 to 25 years of age, in the Cantons of Bern, Solothurn, and Neuenberg, and found that of this number 76.2 per cent. were hypermetropes. Dr. Max Conrad examined the eyes of 3036 students of from 6 to 18 years of age, in Königsberg. He states that at 6 years of age 70 per cent., and at 18 years 23 per cent. are hypermetropic. As the number of children affected with strabismus, however, assumes no such colossal proportions as these, it is evident that there must be some other cause than mere deficiency in the refractive power of the eye concerned in the production of squint.

Donders thinks that the turning in of the visual organ depends to some extent upon the angle between the visual line and the axis of the cornea being greater in squinting hypermetropes than in other hypermetropes of the same degree. The difference (1°) which he assigns, however, would be scarcely perceptible, and it is difficult to imagine that it could have so great an effect. It becomes necessary, therefore, to look further for the cause. Congenital difference in the degree of refraction of two hypermetropic eyes would no doubt have some influence, but we very frequently meet with this condition in people who do not squint.

It is well known that the strength of the ocular muscles, tested by their power of overcoming prisms, is very different in different individuals. The internal and external recti muscles of twenty emmetropes were recently examined in this way by the writer by means of Nacet's *prisme mobile*. The test-object used was the upright bar of a window sash thirty feet distant. The *prisme mobile* affords different results in testing the muscles in this way from those given by the employment of ordinary prisms. In using the latter, at every change of glasses the eye relapses to its straight position, that is to say, the optic axes become parallel, and when the new prism is placed before the eye the two images are so far apart that often one only is noticed, and there is no desire for binocular vision. But in the use of the *prisme mobile* the increase in the refractive value of the prism is so gradual and continuous that the images are kept superposed until a point is reached where the over-acting muscle can bear the strain no longer, and the two images become suddenly wide apart. It will be found that prisms of from 15 to 20 per cent. greater strength can be used in this way with retention of the single image than when separate prisms are used in the spectacle frames. In testing the internal rectus, however, it was frequently necessary to supplement the *prisme mobile* by other prisms. The results obtained were as follows, and represent the amount of strain each muscle is capable of in its efforts to satisfy the demand for binocular vision.

Cases of Emmetropes.

No.	Name.	Prism overcome by internal rectus.	Prism overcome by external rectus.	Strength of ext. rectus compared with int. rect. at 100.
1	L. C.	34 ⁰	4 ⁰	12
2	N.	34	7	20
3	T. W. E.	34	10	30
4	F. R.	30	16	53
5	F. E. D.	24	8	33
6	S. I. S.	20	7	35
7	B. L. L.	16	10	62
8	I. M.	14	10	71
9	G. C. H.	43	6	14
10	H. E. G.	17	6	35
11	S. B.	35	5	14
12	T. D. F.	30	7	23
13	R. R.	25	6	24
14	F. L. N.	32	9	28
15	E. D. F.	26	7	27
16	Mr. B.	30	8	27
17	R. M.	28	8	28
18	T. M.	36	14	39
19	Mrs. D.	28	12	43
20	Myself	46	5½	13
		Average, 29 ⁰	Average, 8¼ ⁰	Average, 28

The same experiment made with hypermetropes (Ht being corrected in each case by the appropriate glass) resulted as follows:—

Cases of Hypermetropes.

No.	Name.	Prism over- come by inter- nal rectus.	Prism over- come by exter- nal rectus.	Ht.	Strength of ext. rect. com- pared with int. rect. at 100.
1	C. N. T.	32 ⁰	10 ⁰	1¼	31
2	N. S.	18	7	20	39
3	B. C.	22	12	48	55
4	I. D.	14	7	8	50
5	M. C.	30	13	4	43
6	A. A.	25	12	18	48
7	A. K.	16	10	24	62
8	M. C.	30	13	12	43
9	Mrs. B.	29	13	20	45
10	P. J. H.	30	10	15	33
11	E. M.	38	12	16	32
12	L. S.	28	14	48	50
13	L. D.	17	16	42	94
14	A. H.	19	12	24	63
15	W. G.	14	12	7	86
16	M. S.	30	15	56	50
		Av. 25 ⁰	Av. 12 ⁰		Av. 48

It will be seen, from an examination of these lists, that the strength of individuals varies as much in their ocular as in other muscles of their bodies, and that in addition, the relative strength of these ocular muscles, as compared with one another, is liable to great variation in different persons, although we might suppose, *a priori*, that their comparative force would be nearly constant.

Taking the last column of figures in each table as the basis of calculation, we find that the relative strength of the external rectus as compared with the internal, valued at 100, averages 28 in emmetropes and 48 in hypermetropes. The weakest external rectus among the emmetropes = 12, among the hypermetropes = 31.

It would seem further, that in hypermetropia there is, with unusual development of the ciliary muscle, a corresponding power of the external rectus in order to counterbalance the sympathetic effect of the former upon the internus, and that failing this increased strength in the externus we must naturally expect to have strabismus. The hypermetropes who will retain binocular vision are those who start in life with external recti equal to or stronger than the average. Those who will acquire squint have the external recti weaker than the average.

According to Donders strabismus generally arises about the fifth year, but sometimes as late as the eighteenth. The former of these ages evidently points to the commencement of the methodical employment of the eyes upon near work, as in learning to read, etc., and of course involves, in hypermetropes, extra strain of the accommodation and the results heretofore described. On the other hand, a squint is often reported by the parents of the child to have originated in an attack of measles or other illness. Here, when the whole body is weakened by disease, the child commences to tax its eyes too early during convalescence. The external rectus being naturally weaker than the internal, and now still further reduced in strength, easily succumbs before the internus, when the latter sympathizes with a great effort made by the weakened ciliary muscle to compensate for a deficient refractive power. As convalescence progresses and health and strength become fully restored, the external rectus may, and often does become rehabilitated, exercises its full power, and the squint disappears. But it often persists.

There is generally a period in all cases of strabismus when the excessive convergence is only observable during near vision. In distant vision the optic axes are parallel. Soon the squint is noticeable as well in distant as in near vision. It is now often alternating. Sometimes one eye is used, sometimes the other, and both are in this way exercised. Or one may be used for near and the other for distant sight. This is especially apt to happen if the degree of hypermetropia is greater in one eye than in the other. Soon, however, the patient gets into the habit of using one eye only; then the disused one becomes less and less sensitive to the rays of

light until it is finally nearly or quite blind. Now a curious change often takes place. No further calls are made for exertion upon the ciliary muscle; the internal rectus relaxes accordingly, the external rectus asserts itself; the strabismus commences to disappear, and parents and friends remark that the eyes are getting well of themselves. "The child is growing out of its squint." But if the vision is now tested, the eye will be found blind. When a child is said to be growing out of its squint, it simply means that it is becoming blind in the squinting eye.

The obvious treatment, then, for hypermetropic strabismus is to prevent its becoming confirmed by putting correcting glasses on the child while the visual axes are yet parallel for distant vision. I have done this in a number of cases with most satisfactory results. In some instances the children were not more than five years of age. Of course there are many objections which will be raised against such a plan of treatment. Of these, the great liability to breakage of the glasses and perhaps to injury of the eyes in the accidental falls to which children are so liable, the absurdity of the child's appearance, and the difficulty of getting children to wear spectacles are the oftenest urged. The liability to breakage is chiefly a question of expense which parents must decide for themselves. I have not yet seen a case of injury to the eye incurred in this way. As to appearances it is surely better to sacrifice something of appearance to the preservation of sight. As to the last objection, I have generally found that if the degree of hypermetropia is moderately large, and the child fairly intelligent, it is usually delighted with the glasses, and has no disposition to throw them aside. In cases, however, where for various reasons glasses cannot be used, we must resort to temporizing measures having for their object the preservation of the normal acuity of vision in the squinting eye. This is accomplished by putting the other eye under the influence of atropia occasionally, or, still better, by binding it up for a few hours every day, and thus forcing the child to use the squinting one.

The figures given in the foregoing tables are, of course, too few in number to establish an absolute average of strength for the two muscles in question, either in emmetropia or in hypermetropia. It is claimed, however, that they do serve, as far as they go, to illustrate the difference in the two conditions; for they are taken just as they came, are all cases of adults, and no case is omitted that was tested. It is perhaps not venturing too much to say that if the list of persons reported as emmetropic had been instead hypermetropic, it would not have been difficult to pick out those who would have been liable to acquire strabismus. They would probably have been, under favourable circumstances, Nos. 1, 2, 9, 11, and 20.

The conclusions which seem to be justified by the argument in this paper may be formulated as follows:—

1. Convergent strabismus occurs in those cases of hypermetropia where

the external recti muscles, as compared with the internal recti, are weaker than the average.

2. To prevent it, and the consequent amblyopia, we must use glasses to correct the total hypermetropia as soon as the squint makes its appearance.

ARTICLE X.

A CASE OF THE SO-CALLED XERODERMA (OR PARCHMENT SKIN) OF HEBRA.¹

By LOUIS A. DUHRING, M.D., Professor of Skin Diseases in the University of Pennsylvania, Dermatologist to the Philadelphia Hospital, and Physician to the Dispensary for Skin Diseases.

THE disease of which the following case is an example is of such rare occurrence that any information respecting it must prove interesting and valuable. But very few cases have been recorded, and these quite lately, so that until a recent date no account of the disease whatever existed. The case before us differs in several points from those which have been described by Hebra and Kaposi and by Taylor, to which I shall refer later, and shows that the affection is not necessarily accompanied by such marked symptoms of atrophy as occurred in the two cases related by Hebra and Kaposi.

The patient, Annie McC., is a young woman, aged seventeen, of Irish parentage. Her father is living and is healthy; her mother is deceased, and is said to have died of cancer of the womb. She has three brothers and one sister living, and had four other sisters, who died quite young from various infantile diseases. Neither parent, nor any of the brothers or sisters exhibited any disease of the skin. There is no history of consumption.

According to the statement of the parents, the affection made its appearance at the age of six months, upon the face, more particularly over the nose and cheeks, in the form of ordinary freckles. At birth the skin was normal, and the child was considered healthy. The lesions gradually spread over the rest of the face, neck, and extremities, increasing in number from year to year. The early history of the disease cannot be ascertained more minutely, but it is said that at the age of nine years the lesions were quite as extensively distributed and as well-marked as at present, and that but little change has taken place since this date, except on the face and on the backs of the hands. Three years ago, when working in the mill and using some strong-smelling, offensive oil for lubricating the machinery, there appeared on the upper part of the cheeks about a dozen pin-head sized, solid, "reddish pimples." They came in the course of a week, and were confined to the cheeks. Some eight girls were similarly occupied with the machinery, all of whom were affected in the same man-

¹ Read at the Second Annual Meeting of the American Dermatological Association, at Saratoga Springs, Aug. 1878.

ner. The eruption disappeared within three or four weeks by scaling and slight crusting, and was succeeded in our patient, according to her statement, by the pock-like marks which still remain; but as far as she knows none of the other mill-hands were thus marked. She seems positive that the cheeks and nose were badly freckled before this eruption appeared, and that the atrophic marks followed, obliterating in a great measure the former freckles. Within the past five years she has noticed that on the backs of the hands the freckles have been here and there very slowly and gradually disappearing, and that in their place small areas of thinned whitish skin have come. No more particular information concerning the lesions can be obtained.

Present Condition.—The patient is tall and spare. She has dark-brown hair and eyes, and a fair skin upon the unaffected regions. The general nutrition of the body is good, the trunk and extremities being supplied with the average amount of adipose tissue. The general health is fair, and the various functions are normal. The sudoriparous system acts freely, but the sebiparous glands are somewhat sluggish in their action. The hair and nails are healthy, likewise the tongue and mucous membrane.

The disease occupies the scalp, face, ears, neck, chest, back, shoulders, arms and forearms, backs of hands and fingers, legs and backs of feet. It consists of an extensive, well-marked, disseminated, deposition of pigment, in the form of pin-head to split-pea sized, yellowish, brownish, and blackish, freckle-like lesions, together with the occurrence here and there of minute linear or rounded, pin-head sized telangiectases, and pin-head and split-pea sized, whitish, more or less defined, atrophic spots. There exist therefore three kinds of lesions to be considered, namely, pigmentary, telangiectasic, and atrophic.

The pigmentary deposit is very decidedly the most prominent feature of the disease, and is that for which the patient sought medical advice. All of the affected regions are thickly covered with what appear at first sight to be unusually defined, large and small, light and dark freckles, giving the skin a variegated, checkered look. The patient and her family believe the disease to be one of a singular form of freckles, and certainly the appearance is such that no other view would be entertained by any one were it not for the presence of the other lesions, to be presently described. The lentigines, or freckles, as I shall designate these lesions in speaking of them, exist in profusion, scarcely a portion of the affected regions escaping. They are disseminated, showing no regularity of distribution, nor any disposition to group. They are scattered over the surface at haphazard, as in the case of ordinary freckles. They are, however, as will be presently described, more abundant and more marked in some localities than in others. In size they vary from a small pin-head to a large split-pea, the majority perhaps averaging the size of large pin-heads. They are discrete or confluent, and are for the most part sharply defined, with very irregular, angular, jagged outlines, which cause them to stand forth conspicuously against the surrounding healthy skin. Their colour varies from light yellow to black; while the majority are of a dirty-yellowish, brownish-yellow colour, others are deep brown and some are quite black. The blackish lesions are, however, exceptional. The pigment is distributed unevenly, as in the case of ordinary lentigo.

Concerning the telangiectases, which, it may be here stated, are by no means numerous, it is observed that they occur here and there, and that they exist for the most part as small, ill-defined lesions. They are true

telangiectases, differing in no way from those encountered independent of other disease. They are made up of a congeries of capillaries. They are circumscribed or diffused, flat, raised, or slightly rounded, irregularly rounded, angular or linear, pin-head and even smaller sized, bright or deep red lesions. They are met with here and there over the whole of the invaded surface, but are most distinctly marked about the neck and chest. They are nowhere so numerous or so large as to be conspicuous, and they might readily be overlooked by the casual observer, or be regarded simply as accidental telangiectases. Occasionally only are they elevated, and seldom so to any extent, the majority being on a level with the surrounding skin.

The atrophic spots, like the telangiectases, are few and scattered, occurring here and there in between the freckles. They consist of pin-head and split-pea sized, rounded or irregularly shaped, somewhat glistening, whitish lesions. They bear resemblance to the marks of varicella or of variola, but they are more irregular in outline, more superficial, and less circumscribed and sharply defined. Taken between the fingers the skin is noted to be slightly thinned, to be soft and supple, and to have a smooth, polished surface, like glazed paper. The skin can be readily pinched up. Some of the lesions can be detected in passing the hand over them; in other places they are barely or not at all perceptible to the touch. Their shape and size in many instances are those of their neighbouring freckles. Here and there, as on the backs of the hands, there exist large, split-pea sized, irregularly shaped patches of atrophied skin, the result of several adjoining lesions having undergone simultaneous atrophy. The atrophy of the skin, however, viewing the process of atrophy as a whole, is insignificant, and is in some places so slight as to be scarcely appreciable.

The sensibility of the skin is not diminished. There are no feelings of contraction, stretching, or tightness of the skin. There are no subjective symptoms whatsoever.

Having thus given a general description of the disease, we may examine more closely the several regions invaded, pointing out any peculiarities that may be worthy of mention. The hair of the head is dry, but not remarkably so. The scalp is free of seborrhœa. It is well covered with disseminated freckles, which give it a dirty appearance, and which look like small collections of dirty sebaceous matter. They occupy the whole of the scalp, but are not so profuse as upon the face and other regions. They are in greatest numbers over the vertex and on the parietal regions. About the occiput they are thinly scattered. They differ in no way from those on the face, to be presently described. Here and there occur small telangiectases, some of which are typically developed, while others are in a shrunken state, and apparently passing into atrophic spots. Well-marked, complete atrophic lesions exist only here and there; several are observed in the median line where the hair is parted.

The face is well sown with freckles of all colours, but it is by no means so extensively invaded as the neck, chest, back, or arms; nor are the lesions here as large as on the regions just specified. They are least numerous upon the nose and upper part of the cheeks, where exist distinct, mostly superficial, atrophic marks, varying in size from a large pin-head to a split-pea. These lesions are the most pronounced of any of the atrophic ones, and are about as conspicuous as small variola scars, which indeed they resemble in size and in form, as well as in the amount of cicatricial tissue. There are about a dozen of them. They show no regularity of

arrangement. The history of these lesions, it will be remembered, is not perfectly clear, but there is every reason to believe that they are the result of the disease under consideration, and not of the accidental eruption referred to. The telangiectases on the face are few, small, and ill-defined, and occur for the most part on the upper half of the cheeks. They number about a dozen, but only three or four are of any size, the rest being quite small and indistinct in outline. One of the largest is situated on the right temporal region. It is raised, and is about the size and shape of a caraway seed, and of a bright red colour.



The neck, back, and chest are thickly dotted with pigmentary lesions, some of which are remarkably large. Over the back they are found as low down as the lumbar vertebræ, but below the line of the scapulæ they are only thinly scattered, small, and faint in outline and in colour. Over the chest they are numerous, but are no different in character from those on the face or back. They fade away over the upper portion of the mammae, none or very few existing below the line of the nipples. The lower portion of the thorax and the abdomen are entirely free, the skin being normal and quite fair. The telangiectases are more numerous on the neck than on the face, appearing for the most part as small pin-head sized, irregularly-shaped flat lesions, some of them evidently undergoing atrophic change. They are especially noticeable about the clavicles. Atrophic

marks exist here also, but they are small. Upon the back of the neck and over the back both the telangiectases and atrophic lesions are very insignificant.

The shoulders, arms, forearms, and backs of hands and fingers are thickly studded with freckles, being present almost in sheet, and give a decidedly variegated, checkered look to the skin. The extensor surfaces are especially attacked. The regions of the axillæ and the upper half of the arms are comparatively free. The extensor surfaces of the forearms, backs of hands, and fingers are particularly well marked with freckles of large size, and mostly dark in colour. Some are as large as large split-peas; these stand out quite conspicuously, and are noted to be situated at irregular intervals one from another of from one to two inches. Upon the backs of the fingers they extend as far down as the nails. The flexor surfaces of the fingers and the palms are entirely free. The telangiectases are rare over the arms and forearms, but are commoner upon the backs of the hands, where they are small, flat, chiefly of a linear form, and indistinctly defined. The atrophic marks, however, are numerous, and are better defined here than elsewhere, occurring here and there as irregularly shaped, split-pea sized areas of thinned, smooth, whitish skin. Taken between the fingers the skin can be felt to be thinned, but not in a striking degree. The atrophy is of the most superficial character, involving plainly only the uppermost strata of the skin. The condition is not unlike the senile atrophy often met with in patches on the backs of the hands of old men who have been exposed to an outdoor life. The patient is not aware how long these atrophic lesions have existed, but she remembers that formerly the backs of the hands were much more freckled than now, and she states that the whitish, cicatricial areas have developed very gradually through a period of years. She does not recall ever having observed telangiectases here, but inasmuch as she is far from being a close observer they may nevertheless have preceded the present lesions, which, I think, was without doubt the case.

The buttocks and thighs are free of disease, but the lesions again show themselves sparsely about the knees. The legs, especially the extensor surfaces, from the knees to the ankles, and the backs of the feet, are invaded with pigmentary lesions only. No telangiectases nor atrophic spots are to be found. The freckles are numerous, but are much smaller, less distinct in outline, and lighter in colour than those on the arms. The backs of the toes and the soles are not involved.

Remarks.—We have in the disease under consideration unquestionably a very rare manifestation. The case described is the first example of the affection that I have met with in Philadelphia. Some few months since, through the courtesy of Dr. R. W. Taylor, of New York, I had the opportunity of carefully examining three other cases of the same disease, residing in New York. These cases are well known to several dermatologists of New York, and, together with other cases, formed the basis of an elaborate and exhaustive article on this disease by Dr. Taylor, which was presented at the first annual meeting of the American Dermatological Association, in Sept. 1877.¹

¹ The article has unfortunately not as yet been published, and I am therefore debarred from referring to it more in detail.

From a review of the case presented, we may note the following points of interest. In the first place, the early age at which the disease made its appearance. This statement is entirely in accord with the history of both Hebra's and Taylor's cases, the disease in every instance having appeared in early life. The extremely slow evolution of the symptoms, and the chronic course of the affection as a process, were also noted in the above cited cases. As has been already stated, the pigmentary lesions differ in no essential particular from common lentigines. The patient was indeed on several occasions treated for freckles. The lesions, however, are not only larger but are much more deeply pigmented than in common lentigo, the blackish lesions being singularly conspicuous and peculiar. The telangiectases present nothing unusual. The atrophic marks are remarkable for their superficial character, the atrophy being confined to the uppermost layers of the corium, and in all probability not extending below the papillary layer. They may be compared to the well-known maculae atrophicæ, but they are even more superficial, and are less markedly circumscribed, and less conspicuous.

The relation one to the other of the several kinds of lesions is a most interesting topic. From the history of the case, as well as from the present appearance of the lesions, it may, I think, be considered as pretty clearly established that the following course is the usual one. The pigmentary spots are the first symptoms, which in a variable time are here and there succeeded by the development of telangiectases, occupying as a rule the whole or greater portion of the freckle. They continue for a longer or shorter period, when they begin to contract and undergo atrophy, finally disappearing, to be followed by the atrophic macules. As the telangiectases happen to be small or large, superficial or deeper-seated, will the subsequent atrophic spots be slight or extensive, superficial or deeper.

Viewed from a pathological standpoint it is difficult to know where the disease should be placed; whether among the pigment hypertrophies, with the new growths, or with the atrophies. Hebra and Kaposi have regarded the affection as an atrophy, and have considered it under the head of the diffused idiopathic atrophies, along with senile atrophy. They have given to it the name "xeroderma," or "parchment skin," a name which, however, as will I think be admitted, is by no means appropriate to the phase of the disease represented by the case under consideration. In their work on diseases of the skin¹ they give brief notes of two cases which had fallen under their observation, and refer in a few lines to two other cases that they had seen, being the whole material from which their knowledge of the disease is drawn. These cases constitute, I believe, the only examples of the affection that have been published. In Hebra's and Kaposi's cases (both girls, eighteen and ten years of age, in both of whom the dis-

¹ New Syd. Soc. Transl., vol. iii. p. 252.

ease had existed since early childhood), the process assumed a much severer type than in my case, the atrophy being marked and extensive. Kaposi thus speaks of the atrophy in the first case, aged eighteen: The skin "was also tightly stretched, as if contracted, was pinched up into a fold with difficulty, and felt very thin. Its surface was smooth in some places, whilst in others fine epidermic lamellæ peeled off; or there were quite flat, linear furrows marked out on the epidermis, so that the surface appeared as dry as parchment, and wrinkled, whilst the skin itself was tightly stretched." Concerning the atrophy in the second case, it is stated that "the epidermis, especially on the eyelids and on the cheeks, was wrinkled and shrivelled, the upper eyelids being in consequence drawn somewhat downwards, and the lower ones drawn down and everted, the eyes, therefore, seeming from above too small, and from below incompletely covered. In the same way the oral and nasal apertures were somewhat diminished. In addition, the skin was moderately tense, and was less readily than normally pinched up into a fold, but this could always be accomplished. The subcutaneous layer of fat was not altered." It will thus be seen that the atrophy formed a most important symptom in these two cases, a symptom, however, which was by no means either extensive or striking in my case; nor was there any indication of the process assuming any proportions similar to those presented in Hebra's and Kaposi's cases. In three of Taylor's cases, those that I saw, the atrophy, while more extensive, still manifested the same general characters noted in my case. It is therefore manifest that the term xeroderma is altogether inappropriate for the stages of the disease represented by the present case. It is, moreover, unfortunate that the term xeroderma should have been selected for this new disease, inasmuch as this word has for some years been in use as signifying a mild form of ichthyosis, and is in this sense employed to-day by many writers, both abroad and in this country. While it is admitted that the atrophy of the skin is an important feature, and in some cases the gravest symptom, in the course of the disease, it is also clear from a study of the case just considered that it is not necessarily the most prominent symptom. The pathological process is, as we have seen, a complex one, including hypertrophy, atrophy, and new growth. In view of this association of several distinct processes, occurring simultaneously or consecutively, it becomes extremely difficult to place the disease, and also to name it. Until our knowledge concerning it is more complete, it will, I think, be well to postpone the adoption of any final nomenclature.

As regards treatment, I am able to say but little. Locally the pigmentary lesions may doubtless be treated with more or less success by means of the well-known remedies used against lentigo; while the telangiectases may be removed with a solution of caustic potash (3j to 3j), as in the case of other small telangiectases.

ARTICLE XI.

VASO-MOTOR AND TROPHIC AFFECTION OF THE FINGERS. By CHARLES K. MILLS, M.D., Neurologist to the Philadelphia Hospital, Lecturer on Electro-Therapeutics in the University of Pennsylvania.

THE following case is believed to be unique, and worthy of being placed on record.

E. J., æt. 23, single, mill hand. Her mother died of consumption. She was well, except that she was troubled with sweating of the hands and feet until she was nineteen years old, when she caught a severe cold, from which she suffered several weeks. The morbid perspiration ceased, but she began to have cold hands and feet, and about this time, one morning in early autumn, while on her way to her work, the little finger of her left hand, as far as the second joint, suddenly became cold, white, and numb. After this she observed that when exposed to cold, one or more fingers or the thumbs would get into a similar condition, presenting a frost-bitten appearance. Rubbing energetically would cause redness and a sensation of burning which would last half an hour or longer.

The disorder persisted, growing gradually worse, until the ends of all her fingers and both thumbs were more or less involved. Six months after her little finger was first affected, a slight swelling formed at the point of the right thumb, which felt as if a splinter had run into it. The swollen part became red, and a small abscess resulted, which after being poulticed, soon suppurated, but left a sore spot for many weeks. Similar abscesses appeared from time to time in all her fingers and the other thumb; sometimes two or even three occurred at once on different fingers; and on some, particularly the index and middle, they recurred several times at intervals of two or three months. The first attack in each case caused great pain, but on reappearing the suffering was less severe. Nearly two years after her fingers were first affected, she began at times to notice a coldness and numbness in the forearms, the sensation never going above the elbows, and coming on usually after lying down.

She came under my care early in June, 1878, about four years after the first trouble with her finger-ends. She had been under treatment with Dr. A. Van Harlingen for about a year, and had taken, at various times, cod-liver oil, iron, strychnia, chiretta, quinia, and ergot. Both her general health and the condition of her fingers had apparently improved. Abscesses had occurred less frequently, and had been less severe. Every now and then, however, a relapse of the local trouble would take place, the blueness and coldness of the fingers returning. She had had dyspeptic symptoms; and in April, 1878, she had a severe "cold," suffering considerably from cough, dyspnoea, and pain in the right side.

The following notes on the case, kindly furnished to me, were made by Dr. Van Harlingen January 6, 1878: The weather is clear; thermometer marking 22° F. The patient has just come in from a walk. Her hands are stiff, and their backs to the wrist of a violet colour, which disappears under pressure, but slowly returns. The dorsal surfaces of the fingers are white; the palmar aspects are cyanosed, as are also the hands, but to a less extent. Her fingers feel like frozen rods. After sitting in a warm room for a few minutes, her hands, and particularly her fingers, have become mottled red and white, the palms perspiring freely but not excessively.

On putting them to the fire they tingle and burn. They always act in this way, and have to be warmed gradually. The pulps of the first, little, and middle fingers of the left hand are somewhat clubbed, and at their tips show a pin's head circular scar. The nail of the little finger is rough, atrophied, and blackened towards the end. This nail had been injured by an iron falling on it when she was a child; and several months before, after one of the abscesses, it had come off, but had been reproduced. It can be lifted up for more than one-half its length from before backwards. The finger around it is tender. The other nails are normal in appearance. On the right hand, only the thumb, index, and middle finger show the puckered cicatrix. The middle finger is decidedly swollen at the apex and around the edge of the nail; while underneath the nail a little suppuration is going on, apparently from the external and distal part of the matrix. Sensation is almost or entirely intact. June 4, 1878, Dr. Van Harlingen noted: No abscesses are present, but otherwise her hands are as bad as I have ever seen them.

These notes and the history already given will serve to afford an idea of the state of the patient's hands before she was seen by me in June. Her hands at this time were inclined to be puffy, and her finger ends were cold and numb. Further on in this paper I will give the results of some thermometrical observations. They varied considerably in appearance from day to day: when worst they were decidedly blue; when best they were bluish, white or dull white. The muscles of her hands and fingers were not atrophied, and electro-contractility was not impaired. Sensibility, tested carefully by the *æsthesiometer*, was very good. Electro-sensibility was also retained. Her hands were improved by heat and made worse by cold; they were also better when used and exercised than when at rest.

Examination of her feet showed nothing abnormal in colour or appearance, although they generally felt cold to the patient.

Holding her arms above her head caused her fingers to become worse. On several occasions, in the cold weather, irregular patches of bright red skin appeared here and there over her hand, showing only when her hand was livid with cold, and presenting a curious and vivid contrast to the dark surrounding surface. Once, after dancing, the tip of her tongue became bluish-white, and her tongue felt numb, and as if it had been burned with hot tea or coffee; she was inclined to pinch it in order to bring back its proper feeling; and at the time of this occurrence she experienced also a little difficulty in talking. At the same time her lips became bluish, and the usual condition of her hands worse. Any fright or excitement, or damp and chilly weather, will produce a similar effect, but generally not so well marked as in this special instance.

Three years before coming under observation she had had for a short time a form of "asthma." She had also had an attack of what her physician pronounced to be congestion of the lungs. She had never had rheumatism. She rarely suffered from headache, and never from giddiness. She had no eye or ear affection. She is troubled somewhat frequently with shortness of breath, and sometimes with slight palpitations. She generally sleeps well, and has a variable appetite. Her bowels are regular. Her menses are regular but scant. She is usually pale, her lips generally presenting a bloodless appearance. She is thin, weighing 114 pounds. Her work is weaving in colours for flannel goods. She never heard of any one else employed in the same way being similarly affected.

A careful examination of the patient's chest was made by Dr. Roland G.

Curtin and myself. Over the mitral area a very faint presystolic murmur was heard. The impulse was increased. After exertion a marked presystolic thrill was found. It may be needless to say that the murmur and thrill convinced us of the existence of mitral stenosis. The pulse was small and frequent.

Examination of the lungs showed impaired percussion resonance and vesicular murmur over the entire right side of the chest, with friction sounds about the junction of the ribs with the sternum. Crackling râles, changed by coughing, were heard at both apices. A cavity of considerable size was discovered at the right apex.

The treatment adopted for the relief of the local manifestations in this case was entirely electrical. Three methods of application were employed at different times, viz., localized faradization, localized galvanization, and galvanization of the brain and cervical sympathetic (so called). In localized faradization a strong current was applied directly to the fingers, holding one rheophore to the forearm, wrist, or hand, and applying the other to the ends and every part of the fingers. Moistened rheophores were usually employed, but on three occasions the metallic brush was used. In localized galvanization the current was sent in succession through each of the fingers, placing the positive rheophore on the arm, forearm, or hand, and the negative on the tips and various surfaces of the fingers, using also a strong current. Galvanization of the brain and cervical sympathetic (so called) was performed a few times by first placing the rheophores on the mastoid processes; and next holding a large electrode over the sixth and seventh cervical vertebræ, and a smaller one in the auriculo-maxillary fossa, first of one side and then of the other, allowing in each case a weak current to pass for from two to three minutes. Usually five or six cells of a battery in good condition were employed, the rheophores being well moistened. Apparently considerable improvement has taken place under this treatment, the patient's fingers having a much better colour and general appearance than when first seen; but it will be necessary to wait for the cooler weather in order to decide as to the permanence of the effect. She is better, however, than she was at the same season last year. The treatment has been chiefly localized galvanization and faradization, the central applications having only been used two or three times. She has received twenty-four applications in all. Cod-liver oil has also been administered.

Some interesting observations on local or surface temperature were carefully made with the surface thermometer of Seguin. They were all taken during the last week in July, and after the patient had been under electrical treatment for nearly two months, her hands and fingers feeling and looking better than they had for a long time, and yet it will be seen that they were generally quite low. For the thumbs and fingers in each case the temperatures of the tips or ends were taken. In all the observations except the first, the axillary temperature and that of the room were also noted.

Surface Temperatures, July 26, 1878:—

Right thumb,	85.1° F.	Left thumb,	86° F.
“ index finger,	86.9° F.	“ index finger,	84.2° F.
“ middle “	85.1° F.	“ middle “	87.8° F.
“ ring “	85.7° F.	“ ring “	84.2° F.
“ little “	83.3° F.	“ little “	86° F.
Palm of right hand,	93.2° F.	Palm of left hand,	93.2° F.
Back “ “	89.6° F.	Back “ “	88.7° F.

This table shows considerable variation in the temperature of the finger-ends, ranging between 83.3° F. and 87.8° F. The marked difference between the temperature of the palmar and of the dorsal surface of the hand is worthy of notice.

In the observations which follow, I confined myself to the thumbs, index, and middle fingers as being sufficient for all practical purposes. The processes of localized faradization, localized galvanization, and galvanization of the brain and sympathetic have been described when speaking of treatment.

July 27. Temperatures taken immediately before and immediately after localized faradization :—

	Before.	After.		Before.	After.
Right thumb,	87.8° F.	89.6° F.	Left thumb,	87.8° F.	89.6° F.
“ index finger,	87.8° F.	89.6° F.	“ index finger,	87.8° F.	87.8° F.
“ middle “	87.8° F.	89.1° F.	“ middle “	87.8° F.	89.3° F.
Temperature in right axilla, 101.3° F.					
“ in left “ 102° F.					
“ of room, 83° F.					

It will be seen that an average elevation of temperature of more than 1.3° F. was produced by the faradic applications. The electricity was only applied for a very short time, from one to two minutes for each finger, but the current used was as strong as the patient cared to bear. The high axillary temperatures, which varied for the two sides of the body, were somewhat astonishing. I think that they were due to the condition of the patient's lungs.

July 29. Temperatures taken immediately before and immediately after localized galvanization :—

	Before.	After.		Before.	After.
Right thumb,	78.8° F.	79.7° F.	Left thumb,	80.6° F.	79.7° F.
“ index finger,	78.8° F.	79.7° F.	“ index finger,	78.8° F.	77.7° F.
“ middle “	79.7° F.	79.8° F.	“ middle “	78.8° F.	83.3° F.
Temperature in right axilla, 101.2° F.					
“ in left “ 101.6° F.					
“ of room, 81° F.					

For four of the fingers and the right thumb in this observation, localized galvanization caused an average rise of about 1.6° F., but for the left thumb and index finger an average fall of 1° F. took place. How much this unexpected depression of temperature was due to some accidental circumstance, such as a current of air or some emotional disturbance, I am not prepared to say; but apparently she was under the same conditions throughout. The entire average elevation was about $.6^{\circ}$ F. In the case of the left middle finger, however, 4.5° F. were gained. High axillary temperatures, differing for the two sides, were again observed. Her fingers and thumbs were bluer and felt colder than at any of the other thermometric observations.

July 30. Temperatures taken immediately before and immediately after galvanization of the brain and cervical sympathetic (so called) :—

	Before.	After.		Before.	After.
Right thumb,	87.8° F.	85.1° F.	Left thumb,	91.4° F.	88.7° F.
“ index finger,	87.8° F.	87.8° F.	“ index finger,	84.2° F.	86.9° F.
“ middle “	86° F.	84.2° F.	“ middle “	88.7° F.	89.6° F.
Temperature in right axilla, 101° F.					
“ in left “ 101° F.					
“ of room, 79° F.					

A depression of temperature occurred for both thumbs and two of the fingers, and an elevation for the other two fingers. On the whole, we have an average loss of $.6^{\circ}$ F. A careful repetition of this observation showed a more marked lowering of temperature. The general temperature was still high.

As in surface thermometry we have no absolute "norme" or standard, I thought it advisable to make an observation on the temperatures of my own fingers, in order to establish a relative norme.

Temperatures taken on the writer:—

Right thumb,	93° F.	Left thumb,	93.2° F.
" index finger,	92° F.	" index finger,	92.8° F.
" middle "	92.8° F.	" middle "	92.7° F.

Temperature of room, 83° F.

The therapeutical inference to be drawn from these experiments would seem to be that localized faradization and localized galvanization are advisable plans of treatment, and that galvanization of the centres is not to be recommended, apparently causing a lowering of the temperature of the extremities.

I present this case for its own sake, believing it to possess sufficient interest and peculiarity to call for its publication. The literature of the subject is scant. A few somewhat similar cases have been reported, but none altogether analogous, as far as I have been able to discover. The small abscesses which formed in this case at the finger-tips were a striking peculiarity. In the report of the Proceedings of the New York Neurological Society, at their stated meeting held April 1, 1878, and published in the *Medical Record* for May 11, 1878, mention is made of a paper read by Dr. Thomas A. McBride, and entitled "Digiti Mortui or Dead Fingers." In this article a case similar in many respects to that just given is reported:—

In a man, aged thirty-two, of neurotic constitution, certain parts of the index and middle fingers of both hands, and also of the end of the ring finger of the right hand, at irregular intervals and for varying periods, became cold, numb, and stiff, and of a dead-white paleness. Some loss of sensibility was present in the affected parts, which were moderately painful. These symptoms were replaced at times by a dusky, often purplish-red colour of the same parts, and this was accompanied by the sensation of having been stung by nettles. Fatigue, exposure, cold, emotion, and similar causes brought on the attacks. The patient was phthisical, but had not had active symptoms for four years. He had also suffered for two months in 1874 from subacute spinal paralysis, but had entirely recovered. He was addicted to the use of alcohol and to sexual excesses, but had never had syphilis.

Dr. McBride gives the following brief *résumé* of the literature bearing on the subject: The disease was first described by Brodie in his "Lectures on Local Nervous Disorders," published in 1837, but delivered earlier; referred to by Huston in 1836; by Raymond in 1862, 1872, and 1874; by Nothnagel in 1866; by Estlander in 1870; by Fischer in 1875; and by Allan McLane Hamilton in the *New York Medical Journal* for October, 1874.

Dr. Hamilton's article is entitled "Chronic Vaso-motor Hyper-irritation." He alludes to an affection, consisting of temporary spasm of the muscular coats of the small vessels of some limited spot, the site being usually a part of the hand.

Zunker reported "Two Cases of Vaso-motor Neurosis," in *Berliner Klinische Wochenschrift*, for August 21 and 28, 1876; and Dr. Mader (*Wien Med. Presse*, June 9 and 16, 1878) has placed on record "Two Remarkable Cases of Angio-neurosis." These cases were not particularly affections of the extremities.

Dr. S. Weir Mitchell, in the last number of the *American Journal*, in a valuable paper on a "Rare Vaso-motor Neurosis of the Extremities," reports a series of cases some of which are similar in some respects to the case now presented. The case reported by Dr. Henry L. Stillé, of Guerrero, Mexico, and placed at Dr. Mitchell's disposal by Professor Alfred Stillé, was, on the whole, perhaps most like my own.

A careful examination of the cases mentioned in these articles, however, will show various points of dissimilarity, such, for instance, as the absence of abscesses, duration, differences in the state of sensibility, effects of use and of heat and cold, results produced by change of position, etc.

At present I prefer not to theorize in regard to the cause of the peculiar condition presented by this case. Dr. McBride regarded the condition exhibited in his case as produced reflexly through the vaso-motor system; and believed that it indicated a nervous system of great mobility, but otherwise had no significance. Dr. Hamilton speaks of the affection to which he alludes as due to a hyper-irritation of local sympathetic vaso-motor filaments. Dr. Mitchell, in referring to his cases, says that they probably represent an unrecognized type of spinal or cerebro-spinal disorders, and that they may be found in the future to be associated with distinct lesions of definite regions.

In looking for an explanation of the phenomena presented by my case, the existence of mitral stenosis will, of course, at once attract attention. It is well known that in venous obstruction from cardiac disease, or other cause, blueness and coldness of the finger-ends, and other parts of the body, may be produced. Some of her symptoms were, no doubt, due to or were aggravated by her heart disorder, and also by the state of her lungs; but the marked trophic disturbances, resulting in the formation of abscesses, and the absence of any affection of the feet, among other reasons, would indicate that something more was necessary to a full explanation of the case than the cardiac or pulmonary disease. The coexistence of phthisis, and valvular disease of the heart, with vaso-motor and trophic disturbances in other parts, naturally calls to mind, in a study of causation, the supposed presence in the medulla oblongata of respiratory, cardiac, vaso-motor, and trophic centres.

ARTICLE XII.

A CASE OF UNILATERAL ATROPHY OF THE FACE, ACCOMPANIED WITH SLIGHT PARALYSIS OF THE ADDUCTORS OF THE VOCAL CORDS. By BEVERLEY ROBINSON, M.D., Lecturer upon Clinical Medicine at the Bellevue Hospital Medical College, New York.

A. B., æt. 26, theological student, single, was born in a neighbouring country parish, of which his father was pastor. He came under my care on April 12th of the present year for weakness of voice following prolonged efforts of speech. Until the age of fourteen years no trace of the present disfigurement was visible. After that age friends began to ask my patient as to the cause of the *red* and sometimes *blue* streak upon his forehead, which showed itself during times of excitement, or when his body was warmer or colder than usual. Upon the first appearance of this streak there was no indentation at the vertex and no irregularity of the upper lip. The hair on the top of the head came out gradually, growing thinner and thinner over the area which is now bare.

Patient's hair still falls out, though to no great extent, around the edges of his bald spot. Since first noticed the streak upon the forehead, followed by a notable depression of surface, has grown steadily more conspicuous. This development has taken place very gradually, so that progressive change is unobservable except when the present condition is compared in memory with what existed several years ago (6 to 7). Since patient has been under my care (about $2\frac{1}{2}$ months) atrophy of the upper lip has made slight progress.

Actual state is as follows: Patient's general health is excellent. One is struck upon approaching him by a notable depression over the forehead a little to the right of the median line, which extends from the root of the nose to the hair covering the calvaria, without interruption. Between the frontal depression and the bald place at vertex there is a space about one inch broad where there are some thin hairs, but nevertheless the depressed appearance at their level, when searchingly examined, is found continuous with bare area at vertex, and depression over frontal bone. The bare place at vertex measures four inches in an antero-posterior direction, two inches in its lateral diameter. The depression upon the forehead is two-eighths of an inch broad at its lower extremity between the eyebrows, and half an inch broad where it reaches the border of the hair of the head.

Besides the depression of forehead and vertex there is considerable puckering of the upper lip for one and a half inch from right labial commissure towards the median line. The lower lip on the right side shows also slight puckering. The parts affected are slightly more sensitive to touch than is normal. This is especially true of the bare spot at the vertex. At this level, as well as throughout the extent of the frontal depression, the skin is easily movable over the bones beneath. It is thinner than the skin of the adjacent region, and presents a scarred coloration (bluish-white). The muscular fibres over the inner portion of the right eyebrow are apparently atrophied. Frontal and parietal bones are both depressed, and have evidently lost substance. The portion of the upper lip affected is thinner than its opposite extremity, and permanently drawn up in such a way as to appear as if there were a loss of substance at this level. The right upper lateral incisor tooth is always visible. If the patient attempts to close his

mouth the right labial commissure is notably drawn upwards and towards the right. In conversation there is always quite a gap between the two lips on the right side. The lower lip on the right side is not quite as thick as on the left. The affected portions of both lips contract well under the influence of a mild faradic current, and there is evident pain upon pricking with a pin.

Palate and uvula show no deviation from median line. Taste, smell, hearing, and eyesight are all perfect. Patient has never suffered any pains locally—either in lips, forehead, or vertex. His present throat-trouble dates from about eighteen months ago. It consists mainly of weakness and hoarseness in singing, and at times he has falsetto notes in ordinary conversation. He attributes throat-trouble to undue exertion (singing, shouting, cheering, etc.) under unfavourable ambient conditions of night air and smoky rooms, during his collegiate course. Upon laryngoscopic examination slight paralysis of the adductor muscles of the vocal cords is apparent. There is, however, no congestion and no other morbid condition. Pharynx and faucial opening are healthy.



June 27, 1878.—I have continued to treat patient until present date, partly by means of the faradic current applied externally to the muscles of the throat, partly by astringent solutions carried directly in contact with the vocal cords. He has also taken a tonic internally composed of iron, phosphoric acid, and strychnia. His voice is to-day much stronger than it was when treatment was first begun, although not yet completely restored. The unilateral atrophy, in so far as the upper lip is concerned, has made slight progress.

Remarks.—My excuse for publishing the above case is the relative rarity of the affection of which it furnishes an interesting example. Only

four analogous cases have been brought before professional notice in the United States. One by Hammond, another by Draper, a third by Banister, and this fourth, by myself. I should have been glad to make an examination of the muscular fibres of the upper lip and state their condition. This my patient would not permit. I presume there is atrophy in my case, but not muscular degeneration, on account of the preservation of contractility. The circumstance of the laryngeal paralysis is noteworthy, but from the fact of its improvement under treatment I can scarcely believe there is any relation between the two affections considered other than that of coincidence. The nerve connection of the facial in its course, with the pneumogastric, cannot, moreover, explain any propagation of diseased structure from the periphery towards the nervous centres. And the only probable solution of the problem is that the disease is situated, in this instance, in the bulb, and is an affection of the trophic cells which are the nucleus of the right facial nerve.

Note.—The patient, whose history is recorded above, was presented by me at a stated meeting of the New York Neurological Society, June 2, 1878.

ARTICLE XIII.

SOME EXPERIMENTS ON THE ALLEGED POISONOUS ACTION OF LEAD CARBONATE IN FRESHLY PAINTED ROOMS. By CLEMENT BIDDLE, M.D., Assistant Surgeon, U. S. Navy.¹

THESE experiments were made with the view of investigating the alleged poisonous action of the lead carbonate of white paint from freshly painted rooms; that is, to find out whether the cases of so-called lead poisoning resulting from the occupation of freshly painted chambers were really due to the lead of the paint or not. I had always believed that lead poisoning from this sort of exposure was tolerably certain to follow, until the sudden illness of a friend, supposed to be from this cause, turned out to be nothing more alarming than a bilious attack, when the subject suggested itself to my mind as a proper one for investigation. Can, then, a healthy person be poisoned from breathing the air of a freshly painted room? is now the question for solution.

The possibility of such is held to be probable by all authorities. Dr. Taylor, in his work on *Poisons*, alludes to himself as having suffered from severe colic through respiring the vapour of fresh paint. Prof. Austin

¹ An abstract of the Thesis awarded the Chemical Prize, at the Commencement of the Jefferson Medical College, March, 1878.

Flint, Sr., in his *Practice of Medicine*, says,¹ "lead poisoning has repeatedly occurred from sleeping in newly painted rooms." Trousseau, in his work, speaks of the same fact. Here, indeed, is high authority; and, moreover, Dr. Reese, in his *Toxicology*, considers the effect to be due to volatile emanations impregnated with lead carbonate, the volatile emanations being presumably due to oil of turpentine, as white lead² paint is a mixture of lead carbonate (PbCO_3) and hydrate (Pb_2HO) in the oils of turpentine and linseed.

Notwithstanding the above, I have been unable to detect the slightest trace, after a series of very careful experiments, of lead, conducted under two different plans upon a diminutive room (a box) whose inner walls were coated with fresh white paint, the tests seeking to find minute particles of lead in the air of the chamber.

The introduction of lead into the system, through volatile emanations, in sufficient quantity to give rise to morbid effects, may take place by means of the skin or the lungs. This is the *rationale* of the lead cachexia from the point undergoing discussion. If, however, it can be shown by experiments in which water is proved to have absorbed no lead, after exposure to the emanations of white paint, by the most delicate tests, and also that none can be found in the neighbouring atmosphere under similar circumstances, must the inference not be that lead poisoning cannot result from the occupation of freshly painted rooms?

My experiments will endeavour to demonstrate the above statement.

The apparatus employed was of simple nature, consisting of an oblong box, eighteen inches long, ten inches wide and deep, so arranged that sheets of paper coated with white paint could be inserted within the box on all sides, except the floor, upon which was placed a shallow dish of distilled water. In explanation let me say, that by exposing in such an apparatus a dish of water, any particles of matter given off from the sheets (provided that they were heavier than air) would be apt to be taken up by the water, and readily detected. To make the work more thorough the sheets were coated with the different constituents of white paint, and the exposed water tested separately; that is, an experiment was made with oil of turpentine, and one with linseed oil. This was done to arrive at some conclusion as to the volatile action of these substances upon the lead carbonate of the white paint.

The details of these different trials are too lengthy to be given in full, but suffice it to say, that in each experiment not only were the substances applied to the sheets found to have been absorbed by the exposed water, but also that these substances experimented with might be a means of communication or of spreading the lead carbonate of the white paint. In

¹ Flint's *Practice*, 4th ed., p. 478.

² Attfield's *Chemistry*, 5th ed., p. 185.

other words, the oil of turpentine and the oil of linseed when quitting the paint might carry off small particles of lead. These preliminary trials were then of some value.

An experiment was next made in which sheets of paper were saturated with white paint, and inserted within the experimenting box. Upon the floor of the latter was placed a shallow dish of distilled water. This water had been previously tested with sulphuretted hydrogen (H_2S) to make sure of the absence of lead. The sheets were thus exposed to the water for three days.* Upon removal the water looked clear, with perhaps a slight oily appearance. It was acidulated with a drop of nitric acid (HNO_3), and the sulphuretted hydrogen (H_2S) applied, but no trace of lead could be found.

I have performed the above experiment in another way, that is, by using paint unmixed with oil of turpentine. The results in each case were just the same; a test of the exposed water showing an entire absence of lead. As has been stated earlier in this article, volatile emanations were supposed by some to be the agent by which lead was carried off from paint, but the facts that I have obtained from my investigations are directly opposed to this theory.

As regards the delicacy of the H_2S test for lead, the following experiments were made. It has been shown by some chemists that this reagent will show a distinct brownish tint even from the most minute solutions. Thus, Pfaff¹ placed the limit of the brown coloration in the form of a nitrate at 1 part in 100,000 parts of liquid; Lassaigne at 200,000; and Harting at 350,000.

Several tests were made (five in all); the first with 50 c. c. of water, and one milligramme of lead acetate, and the amount of water gradually increased to 1000 milligrammes. The details of the last trial are as follows:—

Distilled water,	1000 cubic centimetres,
Nitric acid (HNO_3),	1 drop,
Lead acetate ($Pb2C_2H_3O_2$),	1 milligramme.

Through this weak solution H_2S was passed; at first there was no change, but by keeping up a continuous flow of the gas the solution gradually turned a very pale brown, better seen when compared alongside a test-tube of distilled water. The delicacy of this test will be better understood on reference to the following explanation.

1 c. c. distilled water = 1000 milligrammes by weight.

1 milligramme = $\frac{1}{1000}$ th of a gramme.

Amount of water used 1000 c. c.

Amount of lead acetate used 1 milligramme } = by weight to a $\frac{1}{1,000,000}$ th

solution; that is, 1 milligramme of lead acetate dissolved in water, 1000

¹ Micro-Chemistry of Poisons, Wormley, p. 362.

c. c. represents the one-millionth part by weight of lead acetate in such solution.

This extreme limit of reaction is strong proof that had lead carbonate from the white paint of our experiments been present in the exposed water it must have been most minute in quantity to escape detection, and if there, indeed, its infinitesimal character could hardly be credited with lead poisoning.

This completes the examination of water exposed to the emanations of white paint. Mention has already been made in regard to the investigation of the condition of an exposed volume of air under similar circumstances. This was accomplished in the following manner:—

An air-tight box was obtained eighteen inches long, ten inches wide, and ten inches deep, having two openings, one at either end. To one was inserted the nozzle of a bellows, to the other a bit of glass tube with an elbow, the latter terminating in a dish of distilled water.

The principle of the apparatus is as follows: Sheets of paper coated with white paint were to be fastened to the inner walls of the box, and the contained and exposed air was to be forced through the chamber by means of the bellows, the glass pipe at the other end conducting it (the air) to the dish of water. This procedure would carry away all volatile emanations, and bring them in contact with the water. Into the latter the delivery tube of a sulphuretted hydrogen generator is to be inserted.

From this description it will at once be seen that if the exposed air absorbs lead from the coated sheets of the box, it (the lead) must react on passing through the dish of water with the H_2S therein dissolved.

Sheets of paper saturated with white paint were placed within the experimenting chamber, and twenty-four hours allowed to elapse. The apparatus then underwent inspection. A powerful contraction of the bellows caused the inclosed air to make its exit through the glass tube, and to pass into the dish of acidified distilled water. An examination of the latter showed that no lead sulphide was present. The oil of turpentine had had no apparent effect on the lead of the paint. But it had acted on the linseed oil. By its volatility minute oil-globules were suspended in the air of the chamber. This must have been the case, as the application of the bellows caused these globules to appear in the dish of water.

These globules when leaving the paint might have taken with them minute particles of lead carbonate, completely enveloping them as it were, and thus have checked the reaction with the H_2S gas. To determine this they were examined as follows: Under the microscope they presented the shape of circular notched disks whose diameter, measured with the micrometer, was $\frac{1}{64}$ th of an inch.

Chemical investigation was conducted by placing the globules in a porcelain crucible with distilled water, and applying heat to destroy organic matter; this process yielded small black specks, to which were added four

drops of nitric acid, and heat again applied, together with the acid completely destroying all organic matter, and converting any lead present into the soluble nitrate. The residue was redissolved in a few drops of distilled water, and brought in contact with H_2S , yielding no precipitate or discoloration.

Let me add, in conclusion, that an experiment was made with white paint in which benzine was substituted for oil of turpentine. Now benzine is far more volatile than oil of turpentine, and if the mode of poisoning from lead under discussion be really due to volatile emanations, benzine of all substances ought to prove this to be true, but it yielded entirely negative results; in fact, evincing no more volatile action upon the lead of the paint than did oil of turpentine.

ARTICLE XIV.

SPANISH METHOD OF USING THE TESTICLE IN THE RADICAL CURE OF INGUINAL HERNIA. By MIDDLETON MICHEL, M.D., Professor of Physiology and Histology in the Medical College of the State of South Carolina, Charleston.

THESE comments upon the use of the testicle in the cure of inguinal hernia suggest themselves upon the perusal of a rare and curious case recently published in this Journal by Dr. Charles T. Hunter (number for January, 1878, p. 152).

The patient had for a year been in the habit of keeping his hernia reduced by pressing the testicle into the inguinal opening, until the organ becoming finally fixed in this position, plugged up the external opening, retained the hernia, and apparently cured the rupture. The writer remarks that among the many surgical expedients for a radical cure of hernia "*the human testicle, so far as I have been able to learn, has never been utilized.*"

In a series of papers, thrown together in the form of chapters, for a proposed history of the radical cure of inguinal hernia, which I recently published in the *Charleston Medical Journal and Review*, April, 1876, p. 10, will be found an account of an ancient Spanish method but little known to surgeons, I expect, since we find rarely any mention of it, and since it has obviously escaped the research of Dr. Hunter. This method I have referred to in the following manner in the above-mentioned publication:—

" connected with this process is a Spanish method so perfectly remarkable, and so closely resembling in principle the *ensheathing* of an organic plug, as executed by Gerdy, that we cannot omit mentioning it. The account of this singular operation, the design of which was to

obviate the necessity of castrating the patient, may be found in a work published in 1665 by Henry Moinichen, physician to the King of Denmark (*Obs. Med. Chir., Hafniæ*). This writer says that the Spanish surgeons were in the habit of making an incision along the course of the spermatic cord, laying open the sac, and after the reduction of the intestine pushing up the cord and testicle into the abdomen, packing the remaining tissues and cellular structures into the inguinal canal, terminating the operation with the golden suture, and closing the wound. The supposition was that the function of the testicles was thus preserved, but it sometimes happened that the operation was performed on both sides, which lead to the discovery that it had superinduced complete *sterility*; it then became a serious question in the Church whether marriage should be interdicted, and a message was actually sent to Rome, we are told, to ascertain if it were the pleasure of the Holy See that those should enter into the marriage state who were thus rendered impotent. Scultet in his appreciation of this method condemns it as not only useless, but often dangerous and fatal, from the violent pressure and pain to which the testicle must be exposed when forced into a narrow inguinal canal; while, if the passage were sufficiently dilated to admit the ready intrusion of the testicle, the operation would be worse than useless, as the organ must soon again descend, rendering the condition of the individual most precarious. From his remarks upon this subject, it would appear that this surgical process was by no means confined to Spain, but was practised also in some of the Austrian dominions."

Here is a most emphatic use of the testicle as an organic plug, securing it in this capacity by an actual operation, and yet even under these circumstances to no purpose, since the method was abandoned as either inefficient when the testicle descended, or, being retained, underwent atrophy, and permitted the hernia itself to redescend.

The obliteration of the external ring, if even perfectly accomplished, would not remedy the hernia, for the only condition of a radical cure is the occlusion of the entire hernial canal; by the former procedure we only convert a *complete* into what is known as an *interstitial* hernia, and as Dr. Hunter surmises, there must always remain the possibility of displacement of the organ under a *vis-à-tergo* force more or less constantly being applied to the testicle. Should this displacement of the testicle, however, never occur, an interstitial hernia will almost inevitably reappear at some future period, and this will occur, as I have seen, even where an arrest of development retains the testicle abnormally within the inguinal canal. So rare a case is of sufficient interest in this connection to be detailed, and I will therefore state, that some years ago a negro child was brought to me under the supposition that a surgical operation might relieve him. The right testicle was retained within the inguinal canal congenitally, and the right half of the scrotum was not even developed; there was no raphe, and but one-half of a scrotum existed which contained its testicle on that side. This boy has grown to manhood, is married, and has children; is a barber by trade, resides near me where I see him daily; the testicle still remains within the canal, for it could not descend, as there is no scrotal receptacle

for it; occludes external ring and two-thirds of the entire canal; and nevertheless within the last few years a hernial protrusion has taken place and distends the inguinal region most inconveniently, and it may be said hopelessly, since no truss can be applied over the part on account of the presence of the testicle; nor should the attempt be made, since experience has taught that in cases of this rare nature, among *cryptorchides* as they are called, if any inflammation arises in concealed testicle, it is most readily extended to the peritoneum, and death from peritonitis is by no means uncommon.

While this communication is particularly intended to call attention to the use which has been made of the testicle in the cure of hernia, yet much more might be said of the interest connected with so curious and rare a case as the one which Dr. Hunter has put upon record.

ARTICLE XV.

INVERSION OF THE BLADDER. By REUBEN A. VANCE, M.D., of Gallipolis, Ohio.

PRIOR to the day the following case was brought to my notice I had never met with an instance of inversion of the bladder. The phenomena it presented were so novel that I subsequently spent no little time in endeavouring to find what light medical literature could cast on the subject. In a review of the second volume of "Saint Thomas's Hospital Reports," in the *American Journal of the Medical Sciences*, brief mention was made of a paper describing the case of a patient under the care of Mr. John Croft, F.R.C.S., who up to that time had been able to find recorded only three other cases. The following are the notes of my case, taken the day I examined the patient and recognized the true nature of the affection:—

A resident of Jackson County, in this State, named Morgan, called at my office in November, 1877, and told me of a growth from the external organs of generation with which his infant daughter was afflicted, but his description was so obscure that I could form no idea of the case, and felt compelled to decline prescribing until I could see the patient. On the 7th of December, 1877, he returned with his wife and the afflicted child. Reminding me of his previous visit, he introduced his wife, and at once prepared the child for my examination.

When the external genital organs were exposed, a small purplish-brown tumour, the size of a hen's egg, was revealed, which, on closer examination, was found to spring from the upper and inner margin of the vulva, and seemed to originate from the external orifice of the urethra. Externally the tumour was pear-shaped, and, when compressed between the fingers, was elastic and resistant. It could be elevated without difficulty, thus exposing the lower part of the ostium vaginae, and, when lifted away

from the body in this manner, its pyriform shape was exceedingly well marked. In using a probe to determine the relation of the tumour to the urethra, the orifice of the latter was found to encircle the neck of the former. That is, the probe revealed no attachment between the neck of the growth and the walls of the urethra for a distance of nearly two inches. The probe, while free to enter this far above, below, or on either side of the tumour, could not be made to pass further into the bladder. At this point in my examination the child cried violently, and, at each gasp, the tension and prominence of the tumour could be felt to increase.

Desisting temporarily from my exploration, I noted the following points in the history of the case: The little girl was then (December, 1877) in her twenty-second month, and had suffered from dribbling of urine since she was a year old. The constant flow of this excretion caused excoriation of the lower part of her body and the inner aspect of her thighs, and necessitated frequent change of napkins. Shortly after this symptom developed the mother said she observed something filling up, and projecting from, the water-passage. Watching the parts daily, she soon convinced herself that the baby's incontinence of urine arose from something growing out of the urethra, and she consulted several physicians as to the nature of the growth. From the latter she learned that polypi grew from such places, and it was with a view of having the polypus removed that her husband originally came to consult me. The mother also stated that she had passed a wire (a smooth knitting-needle) into the urethra when exploring the parts, that it invariably made the child cry, and crying caused the tumour to enlarge and protrude. In October she saw that a small part of the growth projected even when the child was quiet; and, shortly afterwards, when endeavouring to trace the extent of the growth, the child became excited, screamed violently, and bore down with so much force, that the tumour suddenly enlarged to its present bulk. At times it subsequently diminished to the size of an acorn, but it never resumed its former small dimensions, and never receded within the urethral canal.

While the mother was detailing these facts, the child gradually ceased sobbing and crying—it had screamed incessantly from the moment the parents first started to expose the diseased part—and this, too, while I continued to manipulate the growth and adjacent structures. As the child grew quiet, the tension and prominence of the tumour seemed much less than before, and this change in the characters revealed to the sense of touch was accompanied by a decided alteration in colour. From a purplish-brown hue, the growth changed to a yellow tint. Also, an indistinct feeling of fluctuation attracted my attention to the part, and, as I renewed my examination, the child again commenced to scream and cry. The tumour at once grew tense and hard, and became of a deep-purple colour. Whatever trace of fluctuation there might have been before, disappeared with the first forced expiration. Quite a quantity of fluid bedewed the parts, but, as I had no other thought than that it came from the meatus urinarius, I neglected to search for any other origin. Requesting the mother—who was supporting the child in a semi-erect position before me—to quiet her babe, I explained to the parents my idea of the case, that the tumour was a polypus developed from the mucous membrane of the urinary passages at some point near the junction of the urethra and bladder; that it was the development of the former which caused the incontinence of urine, and that the incontinence now present depended upon relaxation of the urethra and contraction of the bladder. Contraction of the vesical walls accounted

for the fact that the probe passed but two inches from the meatus—a condition which I explained by the dependent position of the tumour, and the fact that it rendered the urethral canal patent, thus permitting the urine to escape as soon as carried into the bladder. My advice to the parents was to have the child operated upon, and I explained the procedures necessary to pass a ligature around the neck of the growth, near its origin.

In order to determine the attachment of the tumour, I had the parents support the child while I examined the parts through the rectal walls. Passing my right forefinger its full length into the rectum, I carried its pulp as near the junction of bladder and urethra as I could—a method of examination peculiarly available in children of that age. Inserting a small female catheter as far as possible along the urethra, I placed a finger on the base of the tumour, and at the same time carried the point of the finger in the rectum towards the supra-pubic region. Despite the fact that the child was screaming its loudest, and struggling with all its might, the tumour, ordinarily tense and resistant under such circumstances, suddenly became so soft and yielding that I directed the father to so move the child's hips that I could see the growth. To my great surprise I found my finger had indented the tumour as it would a soft rubber ball. Releasing the catheter I grasped the growth with my left hand, and, as I compressed it, it slowly collapsed, and began to recede within the urethra, and, as it disappeared externally, my finger in the rectum could feel an increase in the bulk of the structures in the vesical region. At this time the child's hips were elevated above its trunk; directing the father to lower still more its head and shoulders, I elevated its hips as I compressed the slowly diminishing growth. Finally, as the last of the tumour entered the meatus, I followed it with a catheter, and found no difficulty in inserting the latter between three and four inches. While the child was kept in position with its shoulders depressed and hips elevated, I made a careful inspection of the urethra, and found the canal greatly enlarged—enlarged to such an extent that I readily inserted the first phalanx of my little finger into its orifice—and its tissues so relaxed that they scarcely contracted on my finger. Yet the tumour had disappeared, and no trace of it was to be found. With the child before me, I re-examined the parts, and carefully reviewed every point in the case.

My first idea, that the tumour was a polypoid growth from near the junction of the vesical and urethral cavities, was no longer reconcilable with the facts. Despite its seeming impossibility, the only tenable surmise was that the bladder had been turned inside out. The impossibility of inserting a catheter while the tumour protruded, together with the absence of evidences of vesical distension, or even of the presence of that organ in its proper position, and the continual dribbling of urine, contrasted with the ease with which a catheter could be inserted when the tumour was reduced, the immediate development of such tactile phenomena as denoted the return of the bladder to its position, the complete disappearance of the tumour, and the sudden cessation of urinary dribbling, were arguments that could be answered in no other way than by supposing the bladder to have been inverted. I at once explained my change of opinion to the parents, and inquired as to their knowledge of any previous reduction of the protrusion. The mother was certain that it had not receded within the meatus since October. When I inquired about the child straining in defecation, etc., I was informed that they thought nothing of the first development of urinary incontinence, for the child had whooping-cough

when eleven months old, and coughed with great violence. I imagine the parents were surprised at my change of opinion, but when they learned that no operation would be required they were not disposed to criticize the suddenness with which my view of their child's case was modified. The child was ordered five drops of the tincture of *nux vomica* three times a day, and the parents were directed to keep it constantly in a reclining position with its hips elevated, to sponge the urethral orifice with cold water twice a day, and see that it was placed in a recumbent posture when its bowels were moved.

Since my little patient was taken home I have not seen her, but her father has called a number of times. From him I learn that not only has there been no return of the inversion, but the dribbling of urine has been gradually growing less and less. The clinical lesson taught me by my own case richly compensated me for its unpleasant phases, and I now record it, trusting that it may aid in diffusing an acquaintance with the curious phenomenon of which it is an example.

ARTICLE XVI.

LIGATION OF THE COMMON CAROTID ARTERY AT ITS LOWER THIRD—ANIMAL LIGATURE USED; UNSUCCESSFUL; AUTOPSY. By F. PEYRE PORCHER, M.D., Associate Physician of City Hospital, Charleston; Professor of *Materia Medica* and Therapeutics, and of Clinical Medicine, in the Medical College of the State of South Carolina.

WE report this case, though the result was unfavourable, that it may be recorded as such, and because it may be instructive with regard to the selection of ligatures for securing the larger arteries, especially those near the heart. It confirms, we think, the objections held by others against animal ligatures used under similar circumstances.

Besides the usual difficulty of knowing whether the aneurism did not proceed directly from the aorta, the case was regarded as a very desperate one from the beginning. Though very many years in charge of large hospitals, both military and civil, we cannot pretend to any great experience in tying arteries (the femoral twice and the anterior tibial once), yet we have had the benefit of much practice on the cadaver, whilst under the tuition of M. Sappey, in 1854, at Clamart, near Paris, and elsewhere. We have, therefore, some right to declare that the artery in the present instance was extremely deep seated, and this added to the practical difficulties of the operation; besides the other positive dangers threatening life, which existed in the special condition of the tumour itself.

A coloured seaman, æt. 38, a native of Baltimore, and in service for twenty-five years, entered the marine department of the City Hospital

June 22d, 1878. He was of full habit, robust of frame, and remarkably muscular; but there were several cicatrices of former scrofulous abscesses upon the right aspect of his neck. A large tumour also, with a markedly scrofulous look and resembling very closely an immense abscess, which threatened momentarily to burst (the summit being whitish, as if containing pus), was seen on the opposite side of his neck. Upon closer examination it was found to pulsate strongly, with a decided thrill which lifted up the fingers placed upon it—the characteristic *bruit* of an aneurism being also heard upon applying the ear. The tumour included almost the entire left side of the neck, and rested upon the clavicle—the neck being very full, and the muscles enlarged and swollen.

He stated that it had not commenced to become prominent till twenty days previously, and he was convinced that it was like the other abscesses on the opposite side, to which also he had applied soap and sugar, and they had discharged pus. Iodide of potash, grs. xx, was prescribed three times a day, and to maintain the recumbent position in bed. He would not consent to any surgical interference, though advised of the imminent risk of delay.

June 26th. A small and apparently superficial ulceration burst, and a thin, red fluid oozed continually. The dose of iodide of potash was increased to xxx grains, three times a day.

27th. The oozing continued, and the patient having consented to an operation, as the only hope—though an exceedingly slim one—for life, we proceeded, under the advice and assistance of the consulting surgeon, Dr. R. A. Kinloch, to cut down upon and ligate the artery. There were also present our colleague, Dr. J. S. Buist, and Drs. F. L. Parker, T. G. and M. Simons, J. Forrest, P. G. DeSaussure, and the house physicians. Chloroform being administered, a semicircular incision, about five inches in length, was made, commencing near the lower extremity of the thyroid gland, and passing parallel with the trachea and then with the sternal third of the clavicle. The clavicular attachments of the sterno-mastoid were divided almost throughout their extent, and after careful dissection and some difficulty, on account of the great muscularity of the subject, the artery was found deeply placed three and a half inches below the surface of the wound. The vessel being lifted by the fingers, a catgut ligature, previously soaked in carbolized oil, was passed under it on an aneurism needle. The ligature was turned under twice before the knot was completed, and it was drawn tightly and firmly tied, the ends being cut close to the artery. No other vessel required tying; there was consequently very little bleeding, the wound being almost dry when the operation was completed. It was mopped out with carbolized water, and a narrow strip of lint, soaked in carbolized oil, was inserted, and left hanging from its lowest end, to promote drainage, which was not replaced. Interrupted silver wire was used to close the external wound; and ten minims of morphia given hypodermically. All pulsations ceased in the tumour after the artery was secured; but this slowly returned after some minutes, and continued to be felt for a few days, and rather increasing before his death.

It is needless to give the details of the treatment or the daily history of the pulse, temperature, etc. Suffice it to say, that warm carbolized water was injected into the wound, and the pulse having reached 120 and the temperature $103\frac{1}{2}^{\circ}$, veratrum viride was used, with occasional doses of opium, till the one descended to 54, and the other became normal. The

tumour diminished in size sensibly, and the patient's condition was good, till the morning of July 4th, when a violent hemorrhage occurred; and before the house physician, Mr. Rhett (who had been most carefully watching the case from the beginning, and who was resting within a few feet of him) could give his assistance, several pints and quarts even of blood were lost, and the man was dead. Had time allowed in this emergency, it was proposed to open the tumour, remove the clots, stanch the blood, and secure the artery above.

Autopsy.—A careful dissection was made three hours afterwards, in which we had the valuable assistance of Dr. F. L. Parker (Prof. of Anatomy), Drs. W. M. Michel, Buist, and others being also present. It was found that, could the rupture have been anticipated, there would have been abundant space above the tumour to have secured the common trunk, or its external or internal branches. The aneurismal tumour was double, the largest sac $4\frac{1}{2}$ inches in length and $2\frac{3}{4}$ in its short diameter; it lay directly over and external to the artery—the artery having been ruptured about its middle third through the smaller sac, which was still filled with clotted blood deposited in layers like an onion. This smaller sac—2 by 3 inches in dimensions—was given off from the larger, the artery lying below them, and this sac projected under the lower jaw. The artery was found to have been tied scarcely more than a half inch from the aorta, and about an inch and a half from its entrance into the sac.

It will be noted that we could find only a trace of the ligature; it was partly absorbed, or sunk into the substance of the artery. The outer coat of this last seemed to have been cut into by the ligature; it was pervious, however, and there was no clot in any part of it. The inner coat was not cut, but only slightly congested, as it were, just above the ligature. It seemed to us that the catgut might have come loose, or been at least slackened by the action of the fluids to which it was constantly exposed—though it had been firmly tied, and for a while seemed to serve its purposes.

We would henceforth be very careful how we used animal ligatures in operations so near the heart; for in this instance at least we believe that this ligature was virtually of little use, perhaps for days before the fatal hemorrhage; which, if we are correct, was determined by the unrestrained current of blood coming directly from the aorta. We do not think that it was from any collateral circulation established at a period subsequent to the operation;—assuredly not wholly from the thyroid, or the arteries at the distal end of the tumour.

We are much struck with the confirmatory objections very forcibly urged by Dr. E. W. Jenks, of Detroit, against the use of catgut in Cæsarean sections.—(See abstract of Dr. Jenks' paper in the Quarterly Summary of this number of the Journal.)

REVIEWS.

ART. XVII.—*The Throat and its Diseases.* With one hundred Typical Illustrations in Colour, and fifty Wood Engravings, designed and executed by the Author, LENNOX BROWNE, F.R.C.S., Ed., Senior Surgeon to the Central London Throat and Ear Hospital, Surgeon and Aural Surgeon to the Royal Society of Musicians, etc. 8vo. pp. xii., 351. London: Baillière, Tindall & Cox, 1878.
The same. Philadelphia: Henry C. Lea, 1878.

JUDGED by the standard of its literature alone, the progress made, especially within the last few years, in Laryngology, has been marvellously rapid. If we regard the publications of Morgagni, made previous to the present century and embracing the results of his anatomical and to a certain extent pathological investigations, as the point of development, it is not difficult to demonstrate that they, incomplete as they perhaps were, were the means of opening the way to a more correct appreciation of much that prior to his time was involved in obscurity and ignored, and, still further, by exciting professional attention and stimulating interest, led in the first half of the present century to an earnest seeking for the truth. We recall to recollection works, many of them even to-day classical, which left their impress upon this period, the studies of Müller and Henle upon the physiology and comparative anatomy of the larynx, the valuable additions made to the existing knowledge of its pathological anatomy by Cruveilhier, Rokitsansky, and Rheiner, and to its pathology and therapeutics by Cheyne, Albers, Ryland, Porter, Trousseau, Belloc, and many others.

We deal specially, however, with the period commencing with the year 1858, a most eventful one in the history of the art, as results have proved. The importance of the physiological toy of Garcia was now seen, appreciated, and utilized by the genius of Czermak and through the labours of Türk, and the laryngoscope was introduced into medical practice to become an instrument of precision and an aid to diagnosis, indispensable and of immense power for good. There is no necessity to dwell upon the radical changes that the little instrument at once effected in all preconceived ideas regarding the physiology, pathology, and therapeutics of the larynx; they are well known and were to be expected. Completeness of revelation, with favourable opportunity for precision in local treatment, worked their natural results, and laryngology became for the first time an exact art and science.

With this revolution of old ideas came naturally a new-born and increased stimulus and incentive to work on the part of all investigators. A new, practically untrodden, and fruitful field, now illuminated by the clear rays of the laryngoscope, was open to all, and the results are, and have been for recent years, apparent in the literature of the art—a literature which, according to Ziemssen, abounds to-day in recorded observations to a degree that is almost oppressive. Aside from the innumerable

monographs and articles, good, bad, and indifferent, scattered throughout the journals of all lands, the elaborate works of Czermak, Türk, Von Bruns, Gibb, Mackenzie, and Mandl stand forth as landmarks of progress, and bear good and ample testimony to the extent and excellence of the work done by the earlier observers with the laryngoscope, while the still more rapid multiplication of like books within the past year or two, embracing the names of Fauvel, Labus, Zaverthal, Isambert, Mauriac, Massei, Burow, Von Bruns, James, Browne, and others certainly seems to argue favourably for a constantly increasing interest in, and a more extended cultivation of, this important branch of science; for we take it to be an evidence of a general and healthy growth in any special department of medicine, when text-books, such as have been alluded to, works which serve the purpose of systematic instruction for the beginner and offer likewise a reliable source of reference for the practitioner, are demanded and produced in deference to that demand, in more or less rapid succession.

The latest of these works now lies before us, and after a careful examination of it, our perusal being begun and completed, in the full knowledge that good text-books upon the subject of which Mr. Browne has written already existed, we willingly record our judgment in favour of the excellence of the work that he has done, and can heartily recommend his book as one eminently suited to meet the wants of the class for whom it is designed, viz., those engaged in the active practice of their profession; and, we will add, he has done even more, he has produced an excellent manual for the student and a valuable work of reference for the specialist, a criticism that we feel sure will be justified by an examination of the book in question, and borne out by many of the characteristics which it presents. We find within its pages ample evidence of originality and depth of research; plain statements, and clear directions, as seen for instance in the chapter on the use of the laryngoscope; no useless verbiage—but a concise and pertinent expression of personal opinion, where it is called for, as shown at many places throughout the work, but notably upon the question of the treatment of laryngeal growths; full information upon many points not usually found in works of like character, some sins of omission being atoned for by an explanation given in the preface as to the intended scope of the work; finally, commendable care in the collection of material, and familiarity with the literature of the specialty, as evinced by the frequent reference to authorities. The work is also well abreast the times in pathology, as exemplified in the sections on scrofulous and tuberculous ulceration of the pharynx, the identity or non-identity of membranous croup and diphtheria, and many other examples which might be cited. Points of excellence might still be specified, but we believe, from what we have already indicated, our readers will admit that the volume is one which will repay an attentive perusal.

Mr. Browne has aimed to produce a practical guide to the diagnosis of the more ordinary diseases of the throat which may occur in practice, and to lay down lines for treatment which in his experience have been successful. In this he has certainly succeeded. All those affections which may be considered peculiar to the throat have been treated as fully as circumstances would permit, both with reference to their local symptoms and their effect on the general health. In the case, however, of those diseases, such as diphtheria, syphilis, and phthisis, which, although manifesting grave symptoms in the throat, and requiring special local treatment, are, in point of fact, primarily the result of a general poison, attention

has been given principally to the diagnosis and treatment of the local malady. Throughout the work his endeavour has evidently been to avoid as far as possible unnecessary repetition, and this has been aided by the excellent idea of rendering the earlier chapters so complete as to make them a key to the rest of the work. Histories in detail have been purposely and wisely excluded; the author being of the opinion, that when read, which is seldom, they are but very rarely of service to the student, and that clinical study, as the name implies, can only be efficiently pursued in the presence of the patient. Finally, no attempt has been made in the work before us to discuss at unreasonable length questions of purely pathological interest, which would be of but little service to the student, and would only add to the labour of the reader without assisting him in his object.

If we now pass from this rapid sketch of the general outline of the author's work, to the consideration of certain of its details, giving preference to those of a practical character as far as possible, we find that in his opening chapter he at once sets about the task before him, considerably sparing the reader the necessity of perusing the elaborate but time-worn dissertation on the history of the laryngoscope, and of the quarrel between Czermak, Türk, and others concerning priority in the matter of its introduction, with which most books on laryngoscopy open, and tells how the laryngoscope is to be used and in what it consists. He admits that it is difficult (and all teachers will agree with him) to explain clearly, by a mere verbal description, any process requiring technical apparatus and skill, and regards one practical lesson as of more value than a dozen pages of written directions. As many are, however, unfortunately unable to avail themselves of personal instruction, he does the next best thing, and endeavours to make the art of using the laryngoscope intelligible to them by enumerating and describing, somewhat dogmatically, but still in a manner that is novel and certainly very practical, the various steps that are necessary to be taken in making a laryngoscopic examination. He then points out the most probable causes of failure, and gives the student clear directions how to best avoid those which depend on the observer, and to overcome those which are due to obstacles pertaining to the patient, pursuing thus, it will be observed, precisely the same course as would be followed in instructing a pupil, with a case before him. The eleven rules for examining the larynx follow one another in the natural sequence, and are, in the main, plain and explicit, and must, if followed out carefully, lead, in the majority of instances, to success.

We note that the author recommends that the illuminating apparatus shall be placed to the *left* of the patient's head; this is contrary to the usual custom as followed here and in Germany, and possesses some disadvantages, such as the interference of the right hand, the one commonly used to introduce the mirror, with the rays of light as they pass from the lamp to the forehead reflector, which is obviated if the light be placed to the *right* of the patient. To catch the rays of light upon the forehead reflector and to direct them with the proper focus upon the laryngeal mirror, has in our experience always been a matter of considerable difficulty to the student. Rule fifth, which simply states that the reflected light shall be thrown upon the back of the fauces, might, it seems to us, have been made more explicit by a careful description of *how* it can and should be done.

The rules for overcoming certain difficulties which pertain to the observer, and which follow, can be commended. They are excellent, and,

as is plain to see, are the practical outcome of a long experience in the use of the instrument. While they, however, will be of assistance, the beginner must be reminded again that experience is the great teacher, and cannot be entirely superseded by any directions or rules, however good and explicit. The treatment of the difficulties presented by the patient, being either mental, the result of nervousness, or more rarely physical, requires a different course; and we must cordially support the author's statements, that the gentle hand and encouraging word will do more than any other training, and that all mechanical appliances for fixing the patient are to be avoided. For the possible comfort of amateur laryngoscopists it may be added, that intolerance to laryngoscopy may be caused by the disease, such as phthisis, chronic disease of the pharynx, etc., from which the patient suffers, and that the observer may, therefore, unfairly accuse himself of awkwardness.

In the short section devoted to rhinoscopy, many of the rules already given for laryngoscopy are not repeated, although they are equally necessary, but are supplemented by such additional ones as are rendered imperative by the nature of the procedure, associated with suggestions for overcoming certain peculiar difficulties caused by the natural conformation of the parts. We observe that no directions are given for depressing the tongue during the performance of the act; on the contrary, the use of the tongue spatula is ignored, and a valuable means of assistance to obtaining a perfect picture of the parts is therefore lost. Further, we cannot indorse the author's views concerning the great value of a digital examination of the posterior nares, and question very much whether this procedure, extensively employed by William Meyer, of Copenhagen, ever affords satisfactory and reliable results.

In glancing back at the brief account which is given of the laryngoscope itself, we find that, very properly we think, no detailed account of the many different methods of examining by direct and indirect illumination is given to confuse the student; there is certainly nothing to be gained by such a description, the method by indirect or reflected light has long since been found to be the most generally applicable, and therefore the most practical means. As a source of light, gas is recommended; but, it might have been added, sunlight is occasionally of value for the purpose of correctly determining the natural colour of the parts, and for the examination of the deeper parts of the trachea. The description of the forehead reflector and of the laryngoscopic or faucial mirror calls for no comment, though we remark that the author still clings to the (to us) awkward spectacle frame as a means of support for the former; and we pass to the admirable exposition of the optical laws involved in the art of laryngoscopy, which we find upon page 10. So much has been written upon this subject, simple as it is, and so various and so elaborate are the explanations given, that we have often not at all wondered that the student should become completely mystified while wading through page after page of their attempted demonstration. There can be no misconception in the simple statement of the author, that the reflected image (as seen in the mirror) "is laterally symmetrical of the object and not reversed; that is to say, what is right and left in the larynx of the patient, remains right and left in the mirror. At the same time, it must of course be remembered that the patient's right corresponds with the observer's left, and *vice versâ*. The only inversion which takes place is in the antero-posterior direction—the epiglottis, which in the patient's larynx is in front, nearest the ob-

server, appearing at the upper part of the mirror, whilst the posterior part of the larynx appears in the lower part of the mirror." And to render assurance doubly sure, and make the matter still clearer, a diagram illustrative of the simple and well-known optical law upon which laryngoscopy is based is added.

Although it is beyond the scope of his work, written as it is for advanced students and practitioners of medicine, to discuss in detail the anatomy and physiology of the larynx, the author justly holds that some brief account of its structure and uses is essential to a right comprehension of the laryngoscopic image, as well as of the changes made by disease, both in tissue and function, as viewed with the laryngeal mirror; he therefore, in a short and comprehensive chapter (II.), gives all that it is really essential to know, although some details, notably the muscular apparatus of the larynx, have been treated rather superficially, and thus prepares the way for an intelligent recognition of the various parts of the image, seen in the laryngeal mirror, which are described in the chapter which follows (III.)

The idea of analyzing and classifying the symptoms common to all forms of throat disease, in a preliminary chapter (IV.), is an excellent one, and one that is original with the author; it can but save much time, and will undoubtedly lead to a much clearer appreciation of the rational history of disease, as we find it detailed in the subsequent chapters. The practitioner is advised, for instance, in taking a case of throat disease, after the usual questions of identity, and of predisposing and exciting causes, to classify the symptoms under the following headings: "A. Functional or Subjective, including impairment of the functions of voice, respiration, deglutition, and, in many pharyngeal diseases, of the special senses of hearing, smell, and taste; the phenomena of cough and the amount and character of expectoration and of mucous and salivary secretion. Pain, irrespective of exercise of function, and nervous phenomena, such as that known by the term *globus hystericus*, may also be considered under this heading. B. Physical or Objective, embracing all the appearances viewed by the observer within the throat, special reference being given to alterations in color, form, and position. C. Miscellaneous and Commemorative, which include those presented on external examination, as well as those which affect the constitution generally. Here may also be included examination of the chest, of the auditory apparatus, and of the nasal passages."

The details of each of the various classes of symptoms are systematically considered as the chapter proceeds. Here and there throughout the pages which the subject occupies, we find scattered bits of advice, so good and so true, that we are tempted to quote them. In speaking of the symptom nasal respiration, for instance, the statement is made that "no examination of the throat is complete without careful inspection of the nasal passages through both anterior and posterior nostrils;" though it is added, "these are points much neglected both in precept and practice;" and, again, when upon the subject of impairment of hearing, "All surgeons who would be thoroughly acquainted with the study of throat diseases should also acquire facility in examining the auditory apparatus, and should be able to recognize the importance of at least the more common variations in the appearances of the drum head, the value of tests by watch and tuning-fork, and how to pass a Eustachian catheter, or to use a Politzer air-bag." This view, in which all intelligent surgeons will agree, is likewise interesting as bearing upon a question, which we shall probably be

called upon ere long to decide, namely, the union of the specialties of laryngology and otology, two departments which are so intimately connected "that it is difficult to comprehend how an aurist can work satisfactorily without understanding the throat, or how one who occupies himself with diseases of the latter region can fail sometimes to be at a loss, unless he has worked also at aural surgery."

Under the third section, devoted to miscellaneous and commemorative symptoms, we find still another important point—one often, it is unfortunately true, neglected by specialists—insisted upon as follows: "The state of the tongue, the pulse, the temperature, the appetite, and nutrition, the action of the liver, kidneys, and uterus are all of as much importance in laryngeal disease as in any other. This point is one to be remembered, as, in many cases, the special method of examination seems to tell us so much that we feel inclined to make a diagnosis of the malady without asking a question of the patient." And here, likewise, is the utility of external examination of the larynx, of stethoscopic examination of the lungs, of the use of the sphygmograph and of the ophthalmoscope, referred to as most important aids to the observer in making up his diagnosis.

In Chapter V. the reader's attention is directed to the subject of laryngeal therapeutics—medical, surgical, dietetic, and hygienic; and much that is of interest is naturally met with in its perusal. The author's views on the broad question may, perhaps, be best learned by giving one or two of the opening paragraphs, premising that though special attention is necessarily given throughout the chapter to those remedies and methods of treatment which have a topical action, the reader must not suppose, on this account, that general treatment in diseases of the throat is unnecessary; on the contrary, according to the author's experience, which will be in accord with that of all other laryngologists, it is often equally futile to treat throat disease by only topical, as it is by only general means. "In employing topical remedies it is always well to bear in mind the physiological functions of the part to which the remedy is to be applied. For instance, the function of the larynx being to afford passage to air, and not to liquids, the use of sprays to this part is, in the author's opinion, a mistake." With this opinion we cannot assent. The laryngeal spray-tube, used with a high pressure of compressed air, has entirely superseded, in our hands, the use of the laryngeal brush, and with the best results. There can be no question regarding the thoroughness, comfort, and even elegance of the method. "Vapor inhalations are much more suitable, and more in accordance with the natural function of the organ. The same may be said of the practice of blowing powders into the larynx or the administration of snuffs in nasal diseases. They are entirely unphysiological, seldom beneficial, and often deleterious. On the same principle, whenever applications of a liquid character are absolutely necessary, only a very small quantity of the liquid should be applied at a time, and the area of application should be, as far as possible, limited to the exact portion affected."

In speaking of general treatment we are told—

"That it is always specially indicated when the throat affection is symptomatic of any general malady—scrofula, phthisis, or syphilis, for example—or when it occurs in the course of a continued fever, of one of the exanthemata, of diphtheria, or as a result of zymotic influences. In other cases, also, a constitutional diathesis must be combated concurrently with the local trouble. In very many local manifestations, however, general treatment is, if not contraindicated, at least unnecessary."

The author then proceeds, for the sake of convenience in discussing them, to divide topical remedies into three classes, as follows: 1. Those which can be administered by the patient alone, such as gargles, lozenges, powders, inhalations, as well as all kinds of external applications. 2. Those which can be administered either by the patient or the practitioner, including pharyngeal and nasal sprays, insufflations, douches, and external or pharyngeal pigments. 3. Those which, requiring the management of a skilled hand, can be administered by the practitioner only, in which class are contained laryngeal applications of all kinds, except those of the nature of inhalations, and all forms of operative procedure. Space will not allow us to follow out, as carefully as we would desire, the description of, and criticisms on, the above methods of treatment, and we must, therefore, content ourselves with referring those interested in the subject to the original article, where they will find much that is of interest, and some views which are novel.

With Chapter VI., devoted to diseases of the pharynx and fauces, commences what to many will be one of the most interesting portions of the volume before us. The subject is one that is but superficially treated of in the majority of works on throat diseases; and so little really can be found in the literature concerning it that is of any value, that there is a certain satisfaction in finding nearly one hundred pages of the work under review devoted to its careful consideration; and we turn to them, therefore, with a certain sense of satisfaction, and in the expectation of finding much that is of importance, perhaps much that is new. In this expectation we premise we have not been disappointed. Passing over the few general considerations relating to the pharynx with which the chapter opens, and the remarks on acute and subacute pharyngitis, which are judicious and practical, and sufficiently comprehensive, we pause at that devoted to chronic inflammation, to quote the view held by the author concerning the connection of chronic pharyngitis with certain diatheses and diseases of other parts: "Neither acne nor herpes plays an important part as a cause, as has been stated by Isambert and other French authors." Mr. Browne "has found many patients the subject of chronic pharyngitis who were not subject to any form of acne or herpes; but seeing that such affections, as well as granular pharyngitis, are due, in some measure, to disorder of the portal circulation, it is not surprising that they should frequently coexist; and whereas the skin affections require little or no local treatment, it is certain that no form of exclusively constitutional treatment will remove granulations from a chronically congested pharynx." In those cases the obstinacy of which under treatment is well known, where there is capillary engorgement with granulations, he has seldom found the topical application of astringents, and the use of astringent lozenges, sufficient for the purposes of cure, unless preceded by the destruction of the enlarged vessels which supply blood to the follicles. "On these vessels being divided and obliterated by means of a fine galvano-cautery point, the follicles will be seen within a very short time to shrivel up and disappear. Where the galvano-cautery is not available, the same end may be obtained by incising the vein transversely with a long-pointed knife or lancet, and then applying a fine caustic point, with a little pressure to the cut spot." He does not agree with those laryngologists who advise destruction of the granules by caustic pastes (Mackenzie), by cautery wires (Michel), or by blunt cautery knives (Reisenfeld); truly remarking that such plans only treat an effect, and cannot remove the cause.

We find nothing new in the section—concise and well written as it is—on syphilitic ulceration of the pharynx, excepting, perhaps, the fact that the author, who was formerly in the habit of treating all tertiary ulcerations by the daily local application of nitrate of silver, etc., has latterly met with such marked success both as to rapidity of cure and freedom from recurrence, from the employment of the galvano-cautery, that this measure has largely superseded, in his practice, the use of the mineral caustics. But we can commend highly those chapters devoted to scrofulous and tuberculous ulceration of the same part; both treat of conditions concerning which much has of late been written, and about the pathological nature of which many diverse views are expressed. These facts, and the unquestioned rarity of the affections in point, must make the subject one of general interest, and the length of our quotations embodying the author's views, which are well abreast the times, and representative of the generally held view, will therefore, we trust, be pardonable.

Concerning scrofulous pharyngitis, described by Isambert and others as a quite distinct form of disease, Mr. Browne states that he

“does not deny a specific manifestation of scrofula in the pharynx; he only affirms that it is not usually one of ulceration. The form in which he has seen it exemplified is that of a low type of inflammatory thickening of the fauces, of the naso-pharyngeal passages, of the nasal septum, of the glands in the vault of the pharynx, and of the faucial tonsils, accompanied not unfrequently by a similar condition of the neighbouring lymphatic glands, which often undergo disintegration. There is also occasional necrosis of turbinated bone.”

We are indebted to Dr. Fränkel, of Berlin, for the latest and best contribution to the subject of tubercular ulceration of the pharynx. His paper (*Berliner Klinische Wochenschrift*, Nov. 1876) contains the records of several cases which are adduced to support his theory that “miliary tuberculosis of the pharynx is a disease which attacks either apparently healthy persons or those already affected with phthisis of other organs.” Mr. Browne disagrees with him, for he tells us that—

“a very attentive perusal and careful consideration of the paper has led the author to the conclusion that Dr. Fränkel has in no way proved his case, especially with regard to the occurrence of miliary tuberculosis of the pharynx in apparently healthy persons. In none of the cases quoted is any sufficient evidence brought forward to show that the deposit of tubercle in the pharynx preceded its development in other organs of the body, and in most of the cases the diagnosis of tubercle in the pharynx appears to have been made only after evidence of advanced phthisis had been found elsewhere. Dr. Fränkel's paper, therefore, if it proves anything, proves only this, that in cases of tuberculosis, where tubercle is deposited widely over the body, in almost every organ and tissue, the pharynx does not always escape.”

The devotion of several pages to affections of the uvula may excite a smile as one remembers the time-worn story concerning the evils of specialism, but if it be likewise remembered “that a relaxed uvula acts as the excitant, or at any rate as an aggravator of a long train of most inconvenient, not to say serious symptoms, and serves to make the throat peculiarly liable to catarrhal attacks,” no justification will be necessary for considering its diseases under a separate heading. Indeed we affirm that no section of the work before us contains more valuable information nor directions which if utilized will confer greater relief to the patient. We have Aitken's authority for stating, that “while hardly any slight affection of the throat produces such serious symptoms as elongation of the uvula, it is equally true that there is no slight operation that gives

such complete and permanent relief as removal of the elongated extremity."

In the section treating of acute tonsillitis, the following excellent advice is given—advice about which there ought to be no difference of opinion—it relates to the question of the proper time for surgical interference, and the reader is told

"never to inflict unnecessary pain by useless scarifications on the surface of a tonsil undergoing general inflammation. Never to make deep incisions unless there is almost certainty of advanced suppuration. To remove the tonsils as soon as they become sufficiently enlarged in those cases of recurrent quinsy in which there is not chronic enlargement, but in which the tonsil, though diseased, is too small for excision, except on occurrence of the acute inflammation. By this means the disease is at once cut short, and the chance of further recurrence avoided. To recommend removal, on subsidence of the attack, of tonsils chronically enlarged and liable to quinsy."

Chronic enlargement of the tonsils is only, the author believes, to be satisfactorily treated by the one method of excision, and there does not appear to him to be

"any valid reason why there should be two opinions on the question; the operation is simple, and is accompanied with little pain; the result is speedily and always permanently beneficial. All measures of local applications, 'removal without cutting' by caustic pastes, injections into the substance of the gland are useless, and some of them barbarous."

In these statements we fully coincide, and our experience leads us likewise to endorse most fully the positive answer which he gives as to the results which can follow the operation: "Nothing but good can come of it in suitable cases." Still every specialist knows well how often he is asked the questions: Are any ill effects likely to take place after removal of the tonsils? Will the patient be more liable to suffer from cold, or to contract such diseases as diphtheria? and will the voice be likely to suffer?

Catarrhal inflammation of the naso-pharynx, or post-nasal catarrh (Chap. VIII.), next claims our attention—a subject that is of much interest to all specialists, notably so in this country, and one upon which little, until recently, has been written that has practical worth. Even now, all will, we believe, agree with us, that there is still an abundance of room for improvement in our treatment of the affection, and that though its natural history and symptomatology are well known to us, our efforts for its radical cure are not as successful as we could desire them to be. We pass by, therefore, in the present chapter the description of symptoms, as offering nothing specially worthy of notice—simply remarking that the author has alluded to them generally, and made brief notes here and there of special points of distinction, and come to the matter of treatment. Here we find certain novel and original suggestions. The general plan we may briefly outline as follows: The author believes that the best method at the commencement of treatment of a case of post-nasal catarrh is to employ steam inhalations, soothing or stimulating according to the indications. Lozenges, calculated to promote salivary secretion, applications of vaseline with three to five grains of carbolic acid and iodine to each ounce, and with atropia when there is a tendency to recurring coryza, and finally applications of iodoform in ether or vaseline when there is hyperæmia and thickening. Constitutional treatment is all important, and is always to be associated with the local measures. Iron phosphates, phosphorized cod-liver oil, and hydrochlorate of

ammonia with cinchona are his favourite means. When, however, the disease has been of such long standing that excoriation or ulceration of the mucous membrane and submucous tissue of the nasal passages or even necrosis of the turbinated bones has taken place, something more than the above measures is required; the posterior nasal douche is now recommended, and the galvano-cautery used. Mr. Browne has been encouraged to employ the latter in cases which present the "hypertrophic form of post-nasal catarrh with thickening of the tissues attached to the vomer, with or without granulations at the vault of the pharynx," by the success which has attended operations in this region by its means; and therefore has discontinued in his practice the use of all mineral caustics, which, he holds, tend rather to irritate to fresh inflammation (though we cannot see why they should any more than the cautery iron) and to new growth; all cutting operations, which he holds are inadmissible on account of hemorrhage (rather a trivial reason apparently); and finally dilatation, which, as he truly says, is ineffectual and most painful. We are fully in accord with him in his praise of the galvano-cautery as a means of treating these difficult cases; it is, however, not a sole means. We have found nitric and chromic acid, preferably the former, as less disagreeable in its immediate effects, to answer the same purpose, and with them have attained as equally good results as with the cautery; the latter again will be objected to most strenuously by many patients.

We find the ordinary nasal douche condemned; the reasons given being that it does not do its work efficiently, that it produces pain, and that it is liable to cause inflammation of the middle ear, and that it is therefore supplanted in the author's practice by the posterior nasal douche, which latter, judging from the text, we should regard as a remarkably efficient instrument, did we not find further on the statement made, to our surprise, considering its previous condemnation, that "the anterior douche [may be] made to continue the treatment effectively commenced by the posterior." No mention is made of the use of the anterior nasal sprays (Lefferts, Rumbold) for the purpose of irrigating the nasal passages and pharyngeal space, which have in this country largely supplanted the use of the nasal douche, and justly so.

In Chapter IX. we have the important topic of diphtheria presented to us. The author makes no attempt to decide the vexed question as to its identity or non-identity with membranous croup so far as the broad general question is concerned, stating that he

"hesitates to give an opinion contrary to that of many eminent physicians, headed by Sir Thomas Watson and Sir William Jenner, in England, and of such careful observers as Bretonneau, Trousseau, Oertel, Steiner, etc., abroad, but he feels it incumbent upon him to draw attention to certain local evidences of the disease which appear to offer well-marked distinctions between diphtheria and membranous croup, or membranous laryngitis, as it is termed in modern pathology; and also to certain general constitutional symptoms believed to be equally distinctive, which present themselves during the time the local condition is under observation and treatment."

His consideration of the affection is then, we find, principally limited to an enumeration and description of such local symptoms and signs as will best assist the practitioner in making an early diagnosis. As regards local treatment he tells us that the most satisfactory applications in his practice have been those of lime-water, lactic acid, carbolic acid, and the sulpho-carbolates, as advised by Dr. Sansom; he has had no experience

in the use of sulphurous acid, and denounces the employment of caustic solutions, especially nitrate of silver, emetics, or mechanical attempts to tear away the false membrane. Upon the question of tracheotomy he is not very positive, simply observing, that if it is to be performed, it should not be delayed too long, and that it has one strong reason in its favour, viz., that even if it does not save the patient's life, it does, in a very marked degree, diminish the agony of death, as well as lessen the distress of those surrounding the bedside of the sufferer.

With Chapter X. commences the consideration of the diseases of the larynx, and the pathology, symptomatology, and treatment of anæmia, hyperæmia, acute laryngitis, simple œdema, subacute laryngitis, and chronic laryngitis. Under this latter head are included the laryngeal manifestations of syphilis and tubercle, which are in turn systematically, fully, and clearly presented to the reader. There is nothing under the majority of these headings which requires any special notice on our part, the text being sufficiently full on all the different subjects; they will merit careful perusal, and will be found to be of practical value and assistance to those seeking information on the subjects of which they treat. Under the title of "Acute Laryngitis" we find the recommendation "that where a satisfactory laryngoscopic examination cannot be made in young children, the diagnosis may be aided by the introduction of the finger into the larynx." The author adds that such a course is to be deprecated, and most sparingly employed. Still we confess that we are surprised that he should ever advise recourse to such a procedure, and certainly fail to see of what possible aid it can be, even in œdema. The question is often asked, whether there is danger of a simple chronic laryngeal catarrh running into the tubercular form, and our author admits that the fear "is a great source of anxiety," and recommends a guarded prognosis, especially if there be the slightest tendency to phthisis in the patient's family.

Under the same head the treatment of chronic laryngitis is briefly discussed. Here we find the advice given, to us novel, that "in many cases where the mental anxiety has almost gone to the length of hypochondriasis, bromide of potassium has been found of the greatest utility. In other cases, five grain doses of hydrate of chloral have an admirable effect in calming the mind," advice which would seem to indicate that our British brethren are more liable to depression of spirits than their American cousins; the latter, if our experience is any criterion, bearing up well under the infliction of a chronic inflammation of their vocal organs.

Again we are called upon to note the apparent great faith of our author in inhalations and lozenges as a means of medication; a fact, which we have several times remarked in following out his plan of treatment for the various affections which have been already considered. We are somewhat sceptical concerning their usefulness, and regard them as being of very limited applicability; an opinion that, we believe, will be borne out, not only by our experience but that of many others as well. The local astringent solution, which he has found to be most generally serviceable, is that of chloride of zinc, applied, we suppose, by means of the laryngeal brush, although the particular method is not stated; and we observe with pleasure that the direction is added, that the application must be made with the aid of the laryngeal mirror. This is as it should be, and some may be surprised to learn that it is not always so; it is, however, not so many years since we saw at the Hospital for Diseases of the Throat, in London, cases treated by the laryngeal brush, without the aid of the mirror, and this as a rule.

We would willingly pause to analyze the very excellent chapter (XI.) relating to secondary and tertiary syphilis of the larynx, but time and space oblige us to pass on to the equally interesting one on the subject of tubercular disease of the organ (XII.). The diverse views which are held to-day concerning the true pathology of tubercular laryngitis, must be our excuse for quoting, without comment, the opinion of one who has had ample opportunity for practical observation, somewhat *in extenso*.

"That evidence of the tubercular diathesis influences a local laryngeal inflammation in a manner eminently characteristic, and at a period long prior to the discovery of equally well-marked symptoms in the lungs, is a fact which the daily observation of those engaged in laryngeal practice establishes as incontrovertible.

"Whether or not there be tubercle actually developed in the larynx, or what indeed is the nature of tubercle wherever developed, the author does not presume, and indeed does not care, to decide. Seeing, however, that tuberculosis is a disease primarily manifesting itself more especially in the respiratory organs: seeing that catarrh is one of the most frequent excitants to that disease, and that many catarrhal inflammations of the lungs commence in the larynx, it is at least fair to infer that, in those cases in which the eye reveals what has come to be recognized as tuberculous laryngitis before the ear detects the presence of tubercle in the lungs, the disease has primarily attacked the former organ. Not only so, but noting also that the morbid changes in the larynx, as physically evidenced in every stage, are quite different from those of simple catarrhal and of syphilitic, to say nothing of exanthematous and other phlegmonous inflammations, it is not unreasonable to suggest that the factors are also of an equally distinctive character.

"It is quite certain that the pale, opaque tumefaction of the arytenoid cartilages and of the epiglottis in laryngeal phthisis, has not the clear transparency of serous oedema, the active glandular inflammation of simple laryngitis, the hyperplastic infiltration of syphilis, or the angry inflammatory irritation of carcinoma. Nor is the consequent ulcerative process less distinctive; there is not erosion, nor deep excavated circumscribed ulcers, followed by narrowing cicatrices; nor new formations taking on an ulcerative process, but a true carious degeneration, causing loss of tissue, which, commencing superficially at small points, leads to universal destruction of the deeper parts, without extension to neighbouring glands, and with but feeble, if any, attempt, under treatment, at a reparative process.

"It is, therefore, surprising that we should be told with reference to laryngeal phthisis, on the one hand, that 'tubercle appears to play a very secondary part, if any part at all' in its production (Mackenzie); and on the other 'that neither the catarrh nor the ulceration of phthisical subjects presents any characteristic signs by which it could be recognized as such, [and that] the attempts made to establish pathognomonic peculiarities cannot be said to have succeeded.' (Ziemssen.)

"We prefer to adopt the view of Virchow, who just exactly recommends the larynx as the most appropriate place for the study of true tubercle."

In respect to a local treatment for the disease, although we coincide in the statement that the greatest relief can be given by suitable applications, and think that they should always be employed, we cannot bear testimony as to the value of all the means adopted by the author. We fear, for instance, that more harm than benefit will often result to an inflamed and highly irritated larynx—one, we must remember, prone to take on destructive changes at the slightest provocation—from the necessary amount of mechanical irritation, however slight, that will be caused by the introduction of a brush, and our rule has always been in this class of cases to make our treatment as mild and as unirritating as is possible, consistent with efficiency. To this end, we are in the habit of making our applications, with certain exceptions, by means of the spray with compressed air, and have found it to fulfil all indications. Nitrate of silver the author condemns, and very properly so in many, perhaps the majority of, instances. We find, how-

ever, excellent evidence in favour of its use, in certain recent articles (Sawyer, Marcet), and must add that with us it has certainly worked wonders in relieving the terrible dysphagia so often present in advanced cases of the disease, when all other and milder measures had failed.

Inhalations, lozenges, etc., which are recommended, afford but a very temporary relief; the patient demands something more. Chloride of zinc, which is mentioned as the most comforting solution, often acts well. Glycerine of tannin has with us been useless. Bismuth, gum, and morphia is an application, as the author truly says, of much value; administered in powder by insufflation, and forming, it will be noticed, an exception to his general condemnation of this method of administering remedies. We find no allusion to the application of iodoform and morphia in powder or in spray, a more efficacious remedy than the preceding, nor to the iodine and almond oil mixture of Marcet.

We must also take exception to his advice in relation to the operation of tracheotomy in advanced cases of tubercular laryngitis, for he says, somewhat severely, when discountenancing it—

“that it was not unfrequently performed, in pre-laryngoscopic times, on patients who were the subjects of laryngeal phthisis; for this there was the excuse of ignorance of the actual local condition; but the same measure has been adopted even by practitioners, who, using the laryngoscope, should have been aware of the futility of such a procedure.”

The operation cannot, of course, be curative; but it can, and is often, most markedly and mercifully palliative. We believe that there are many cases constantly occurring where it is imperatively demanded at the conscientious surgeon's hands—cases in which the indications for the operation are based upon common surgical principles, and where the relief which it will afford is not only great, but life itself is prolonged for a period extending far beyond the limit “of a few days or weeks.” We have a personal knowledge of such instances, and venture to recall to our author's recollection the similar experience of Seckowiski, Elsberg, Smith, Janeway, Ripley, and others.

The subject of the treatment of benign neoplasms in the larynx by intralaryngeal operation (Chapter XIV.) calls forth a most decided expression of opinion from the author. His views, as will be seen, vary widely in many respects from those which are commonly held, and are, to say the least, often debatable; they are, however, so honestly stated, and bear the impress of such earnest thought and sincere conviction, that they will excite much attention and interest, and will perhaps serve their purpose “of inducing members of the profession to withhold their hands from efforts at mechanical removal of what is often, in every sense, a most benign formation.” They may be clearly gathered from the perusal of certain propositions which he offers for the consideration of the reader, and which may, therefore, though they have already been brought under the notice of the profession in a paper read before the Medical Society of London, and published in the *British Medical Journal* of May 8, 1875, be here reproduced in part, as they are in the volume before us. Mr. Browne maintains that—

“1. Attempts at removal of growths from within the larynx are not in themselves so innocuous as is generally believed, but, on the contrary, direct injury of healthy parts of the larynx, leading to fatal results, is by no means of unfrequent occurrence.

“2. The functional symptoms occasioned by benign growths in the larynx are,

in a large proportion of cases, not sufficiently grave to warrant instrumental interference.

"3. Many of these new formations will disappear, or be reduced by appropriate local and constitutional medical treatment, especially when of recent occurrence.

"4. Recurrence of laryngeal growths, after removal *per vias naturales*, is much more frequent than is generally supposed.

"5. While primary malignant or cancerous growths are of rare occurrence within the larynx itself, benign growths not unfrequently assume a malignant, and even cancerous character by the irritation produced by attempts at removal.

"6. The instruments most generally in use are far more dangerous than those formerly employed.

"7. The cardinal law, that 'an extra-laryngeal method ought never to be adopted unless there be danger to life from suffocation or dysphagia,' should be applied with equal force to intra-laryngeal operations; and it is a subject worthy of consideration whether, in many cases, tracheotomy alone might not be more frequently performed: *a*, with a view of placing the patient in safety when dangerous symptoms are present; *b*, in order that the larynx may have complete functional rest; and, *c*, as a preliminary to further treatment, radical or palliative."

These several propositions are then argued in detail, with what success as to proving the writer's case the reader must judge; they are, many of them, as we have said, novel—perhaps somewhat radical—but, we must admit, are likewise, in many respects, unquestionably true, and at least deserve, from their very importance, careful thought.

The question as to the advisability of operative measures in cancer of the throat (Chapter XV.) is always sure to be pressed upon the notice of the surgeon, since both the patient and his friends are naturally anxious that the obstruction to deglutition should be removed, and that the life-threatening dyspnoea should be relieved. Mr. Browne believes and states "that there can be no objection to operative procedures, provided it be well understood on both sides that the relief, though it may be considerable, is but temporary, and that the inevitable termination can only be postponed." And upon the question of a tracheotomy quotes Fauvel's figures as demonstrating "the utility, not to say necessity, of this operation," asserting, himself, that it is attended with very considerable prolongation of life—a view about the truth of which there can be no difference of opinion.

The interesting question of entire extirpation of the larynx is summarily dismissed in the following words: "As to removal of the larynx entire on account of cancer, it is sufficient to point out that no case yet reported has lived more than six months, while the majority have been immediately fatal."

The description of the symptoms, laryngoscopic appearances, prognosis, and treatment of the various neuroses of the larynx, contained in Chapter XVI., is concise, yet at the same time embraces all that is really essential to know in order to diagnose and treat a case successfully. It will be found of value for reference, and treating as it does of one of the, if not the, in many respects, most obscure department of laryngeal pathology, will be read with much interest. Frequent reference is made throughout it to the labours of Mackenzie and Ziemssen (the name of Gerhardt might have been added) in this particular field, and due credit is given them for the valuable additions that they have made to our knowledge. Browne in his essay upon the same subject has contributed nothing new, but he has given us an excellent and convenient *résumé*. As we glance over it we learn, under the head of laryngeal hyperæsthesia, that neuralgia of the

larynx "is an affection which has received but little attention from laryngologists, and, in the true sense of the term, is rare; since, although patients not unfrequently complain of pain in the larynx as their only symptom, it is seldom that objective causes cannot be found. Of these the more frequent are general anæmia, and especially gouto-rheumatic exacerbations; patients who suffer from laryngeal neuralgia being almost always subject to similar affections of the fifth and of the sciatic nerves."

Neuroses of motion he divides, according to Ziemssen, into paralyses of motion in the domain of the superior laryngeal nerve and those in the domain of the inferior or recurrent laryngeal nerve. We agree with the author that this classification, which is new, is well worthy of adoption. Speaking under the latter head, he does not coincide with Mackenzie in the belief that bilateral paralysis of the adductor muscles of the larynx "far less commonly occurs in connection with amenorrhœa than might be supposed from the writings of some authors;" but says that "in point of fact amenorrhœa or dysmenorrhœa is the more frequently coexistent uterine condition; and the most favourable periods of life for its occurrence in females are at the commencement and on cessation of menstruation." And again that "functional aphonia is much less frequently purely hysterical than is generally considered, and the term 'hysterical loss of voice' but too frequently represents a want of inclination or ability to find out the true cause"—a remark that is undoubtedly true, and the author's plain statement of the fact will meet with the approbation of all careful laryngoscopists, and offers food for thought to the old-time general practitioner. We remark, likewise, that there exists a difference of opinion between Mackenzie and other writers in regard to the appropriate treatment for bilateral paralysis of the abductor muscles of the larynx, a most serious and even dangerous condition. All laryngoscopists are agreed, we believe, upon the necessity of a tracheotomy in these cases as a means of relieving the distress of the patient and prolonging his life; but the former authority considers "electrical treatment scarcely a safe procedure." Mr. Browne pertinently states, on the other hand, that in the only recorded instance in which decided improvement took place (Ziemssen), the benefit was entirely due to the alternate applications of the induced and constant currents, and that in the cases of Gerhard and Duranty, the same treatment, although followed by no benefit, was equally unattended by any injurious result.

The discussion of the subject of differential diagnosis, with a table of laryngeal diseases, in which symptoms, both functional and physical, are contrasted, constitutes the last chapter of the volume before us.

We have, at the beginning of this review, recorded our personal opinion of the merits of Mr. Browne's book, and have aimed throughout to present to our readers such selections as would enable them to judge intelligently for themselves whether or no our opinion was justified. Our task now finished would, however, be incomplete, did we not draw special attention to the profusion of admirable plates which accompany, and, we must add, adorn the text, and which, from an artistic point of view, are incomparably the best that we have seen, if we except the well-known atlas of Türk. The illustrations of pharyngeal conditions specially are unique. The author tells us that all the drawings have been taken from nature, and placed on stone by himself. Two plates of the larynx are photographs in autotype of his original drawings, and all are arranged with special regard to more convenient reference than is usually possible during study of any portion of the text. They can be opened out so as to lie beside the page

descriptive of the disease each drawing delineates. Finally we confess to being sufficient of a bibliomaniac to appreciate most thoroughly the tasteful form in which the book has been issued by its publishers. Good, even elegant binding, thick and softly-tinted paper, broad margins, large clear type, and fine plates, can but excite pleasure in the heart of the lover of books, and he hails the appearance of each new medical work in similar dress with satisfaction, as an index of the progress that is being made in the book-maker's art in our class of literature, and as an evidence that the homely sheep-bound book of our forefathers is happily obsolete.

G. M. L.

ART. XVIII.—*Daltonism or Colour-blindness.*

1. *Dangers from Colour-blindness in Railroad Employés and Pilots.* By B. JOY JEFFRIES, M.D., Ophthalmic Surgeon Massachusetts Charitable Eye and Ear Infirmary. [Extracted from the Report of the Massachusetts State Board of Health, 1878.] 8vo. pp. 40. Boston, 1878.
2. *Incurability of Congenital Colour-blindness.* By B. JOY JEFFRIES, M.D. *Boston Med. and Surg. Journal*, March 28, 1878.
3. *Le Daltonisme.* MM. J. DELBOEUF et W. SPRING, Professeurs à l'Université de Liège. *Revue Scientifique de la France et de l'Etranger*, 23 Mars, 1878.

Of a large number of publications on the subject of colour-blindness, which have given it quite an extensive literature, those whose titles head this article are the latest that have come to our notice.

It is a subject of much interest from various points of view. As M. Delboeuf well says, "It belongs to physiology as well as to physics, to æsthetics as well as to psychology; nor is it a stranger to philology and history." Added to these, or perhaps rather including them all, it has recently claimed a place in the theory of evolution.

Without undertaking to advocate or to question the "Young-Helmholtz theory," it will be convenient to use it in attempting to state what is meant by colour-blindness. Taking it for granted that the three base colours, red, green, and violet, when combined in various proportions, form the solar spectrum as seen by normal eyes, colour-blindness may be said to be the more or less complete inability to perceive one or more of these colours. As each of these colours enters into the composition of all the colours of the spectrum, it will be seen how complicated the result of this defect must be, and what a difficult thing it is to find out with any degree of precision just what the patient does see. No part of the spectrum is to him exactly what it is to a person with normal vision, and his nomenclature is, of course, at fault; he is "obliged to make use of a dictionary which has not been made for him." Of the missing colour itself he has no conception, and a person completely red-blind, however brilliant or learned he may be, can hardly be said to know what he is talking about when he speaks of red.

Very much the most frequent form of colour-blindness is that for red; that for green is next in frequency; that for blue is rare; while cases are on record of persons with otherwise normal vision who were blind for two

of the base colours, or even for all colour. Even when one colour only is involved, the defect may vary indefinitely in degree; indeed, M. Delboeuf inclines to the opinion that no two people see colours exactly alike, that each one has, as it were, a spectrum of his own. The defect may be shown merely by the demand for a greater intensity of illumination for the recognition of a colour. We have met recently with a gentleman who could see only a uniform green in a cherry tree at the foot of his lawn, which to others was "in a blaze of red," with a profusion of fruit, while he had no difficulty in recognizing the red colour of a bed of geraniums near the house.

Colour-blindness is much more frequent than is usually supposed. Dr. Wilson, of Edinburgh, in the examination of 1154 persons, found 5.6 per cent. colour-blind. Prof. Helmholtz admits this proportion; and Dr. Jeffries, among 611 students of Harvard University and the Boston Institute of Technology, found colour-blindness in five per cent. It is believed to be much less frequent in females than in males. The subject of colour-blindness is frequently quite unconscious of the defect; indeed, when it does not exist in a high degree, this is said to be the rule.

The following *résumé* of the observations of Holmgren on this subject is translated from the paper of Delboeuf:—

"It would seem that those affected should be easily detected. Experience, however, proves the contrary. The author has examined the whole personnel of a railroad line, and found that a large number of the employés, though obliged to give attention by day and night to signal colours, had a defective sense without either themselves or others having ever suspected it. Here is the explanation of this strange fact.

"Our senses are directed to the cognizance of the exterior world in a manner entirely practical. Hence it results that objects are invested by us, and that permanently, with qualities that are, at bottom, but our peculiar ways of perceiving. It is thus that a *red carpet* is for us constantly a *red carpet*, even in darkness, even when we are not looking at it. If then we say to a child, this *carpet is red*, he will retain the name, and will apply it correctly every time that he sees the carpet. Now, in fact, it is not only by the colour that he recognizes it, but by a complex combination of qualities, among which the sensation of colour plays but a secondary role. If his colour-vision is defective or not, the child will learn in this manner that the sky is blue, grass green, bricks red, and even if it may happen that, to his eyes, bricks have the same colour as grass, it will never occur to him to confuse these objects and to attribute to one of them a quality that does not belong to it.

"Doubtless Daltonians have no comprehension of certain distinctions established by others; but, after more or less fruitless efforts, the greater number say to themselves that colours offer little problems that they are not called upon to resolve, and think no more of it. But others go further; they persist in finding out the distinctive character of the colours which they confound; they see in it a matter of dimness and intensity of light, acquire a great skill in distinguishing them by this means, and end by deceiving themselves.

"There are nevertheless circumstances in which it would seem that the person must necessarily discover his own defect. It is when he must determine his actions by the colours of objects. This is the case with painters, tailors, and the employés of the marine and railroads. Even here, however, a multitude of causes concur to hide from them continually the anomaly of their visual sense. In the rural districts, among the lower classes, little attention is paid to the colour of objects. If a bucket or a piece of furniture is to be painted, all that is required is that it shall be painted, and that the colour shall be bright; it matters little whether it is red or green or brown. If a garment is to be mended, the essential is that the rent shall be closed, and it is considered a secondary matter whether the patch shall be of the same colour as the rest. The engineer who directs the locomotive is, in the first place, never alone; then, as he knows at what places

the signals are generally made, he looks for them and learns to recognize them by the particular intensity of their light; he has thus no reason to suspect his defect. All the colour-blind on the railroads that Holmgren had occasion to inspect persisted in affirming that they had excellent vision; that they distinguished the signals without difficulty; and that they had never committed a blunder."

Attention was first called to imperfections in the colour sense in 1777 by Joseph Huddart's brief description of the cases of brothers named Harris. The subject never received scientific investigation until the famous English chemist, Dalton, who was red-blind, described his own case in 1794. He was persuaded that his vitreous humour must be blue, and directed that it should be examined after his death.

The term "Daltonism" has been for many years almost universally applied to colour-blindness; but, according to Dr. Jeffries, "It is now, however, generally agreed to give up this use of so distinguished a man's name, and, as has been claimed, 'Daltonism' should mean rather the doctrine of indivisible chemical atoms, and 'Daltonian' a believer in such." *Chromatopseudopsie*, *achromatopsie*, and a number of other hard names have been proposed, but, as they do not express the affection more definitely than "colour-blindness," it seems scarcely desirable to burden the literature of the subject with them.

Dr. Isaac Hays published a paper on the "Impossibility of Distinguishing Colours," in the *American Journal of the Medical Sciences* for August, 1840, and was, we believe, the first to call special attention to the defect as a pathological condition; and in 1845 Dr. Pliny Earle, in the same Journal, reported the singular history of the colour-blindness of five generations of his own family. Comparatively little attention, however, has been given to the subject in this country, and Dr. Jeffries has the merit of being the first on this side of the Atlantic to urge its great practical importance, especially in our railway and marine service.

It is hardly necessary to refer to the fact, so well known to the traveling public, that the use of red and green signals is universal both on land and sea, and that, particularly at night, the proper interpretation of these signals is absolutely the only security against collisions and other accidents. Another fact, not so generally known, but equally evident to those who have given their attention to the subject, is that there are, in every community, a considerable number of persons who cannot distinguish between red and green. One would suppose that the eloquence of these two facts, considered together, would be enough to convince any reasonable mind of the necessity of taking the strictest precautions to exclude such persons from positions where their defect must involve such very grave dangers. This reform, however, has had to contend not only against considerations of trouble and expense and the sacrifice of the interests of the few to those of the many, but against the honest incredulity of those in authority, whose practical experience has seemed to justify their doubts.

As to the manner in which colour-blindness may be concealed even from the knowledge of the person affected, and the fact that railroad employes and others may learn to recognize a signal by the *intensity* of its light without being able to distinguish its colour, we have already quoted the explanation of Prof. Holmgren, of Sweden, who has been more persistent and successful than any one else in urging the importance of this matter. The following practical application of this explanation, by the same authority, is taken from the pamphlet of Dr. Jeffries:—

"Did we not know this we should be greatly astonished to find with what facility a colour-blind railroad employé can distinguish between the red and green

flag, and generally call the red, green, and yellow lanterns by their right colour; but it is the intensity of the light, and not the colour, which governs his decision, and *this is the whole secret*. The flags and lanterns have, in fact, usually a constant difference as to intensity. The green flag is to the colour-blind, as also to the normal eye, undoubtedly of the deepest or darkest colour, and the red the most brilliant. As to the lanterns the red-blind always recognize the red light by its being darker than the green, and the yellow by its being clearer or more brilliant than the other two. The green-blind finds also, in his turn, the red more brilliant than the green, and distinguishes it by this. . . .

"Considering only practically the fact mentioned, and the explanation we have given, we might, perhaps, imagine that colour-blindness had some scientific, but hardly any practical interest, and hence that all the talk that has been made about it in railroad employes in our country was unnecessary, because, as may be said, the colour-blind have often been employed for a long time in railroad service without its being noticed, and without accident or the slightest inconvenience arising; and, finally, that since they can really distinguish the signals (although this is otherwise than by colour) their kind of blindness need not call for any preventive measures. It is thus that a great many persons still reason. We do not stop here to give the testimony of experience on this point in our country. One fact is certain: namely, that colour-blindness in other countries has caused numerous and very fatal accidents. . . .

"That the situation of the colour-blind in respect to signals may be thoroughly understood, we must here add a few important words on this point. What is the intensity of light? Strictly speaking it is nothing but the force of the impression of the light which our eye receives. This, however, is dependent on two factors: one, the quantity of light radiating from the object observed or reflected from it; the other, the strength or amount to which the eye reacts to this, or, in other words, the sensibility of the subjected visual sense. We may readily understand that both of these factors are extremely variable under the circumstances of the engineer's service. The amount of light which comes to his eye depends naturally on the amount reflected from a coloured object, or which, for example, radiates from a railroad lantern. It is very evident that this quantity may vary from many causes, such as the nature of the illuminating material, and the wick, the colouring matter of the glass, its thickness, the peculiar property of the glass, etc. If a little moisture or smoke, vapour, ice, snow, etc., adheres to the glass the lantern is less luminous. A lantern illuminates more in clear than in foggy weather. All this may give rise to mistakes. But, on the other hand, the sensibility of the eye differs greatly under different circumstances. The nervous apparatus of the eye may, like all other parts of the system, vary in its sensitiveness. The same light is brighter to a healthy eye in repose than to an eye fatigued and weakened. Every modification of the intensity of the light is, however, for the colour-blind a *change in colour*. . . . Ask any superior official of a road if he would be willing to take charge of and run a locomotive, assuming the responsibility, when uncoloured signals alone were permitted, and a feeble light meant *danger*, a medium one *caution*, and a strong one *road clear*. If he says no, tell him that these are just the conditions under which every colour-blind engineer has performed his duties. The absurdity is evident at once."

In a communication to the *Chicago Railway Review*, on "Defective Vision considered in its relation to Railroad Management," Mr. Thomas F. Wilson says that he has kept record of accidents by land and water for some years, and gathered all the information he could in reference to them, and is convinced that a large proportion of them were the results of colour-blindness. The comparatively small number of accidents from this cause he attributes to the "high average intelligence and acquired cautiousness of engineers and pilots as a class," and says they acquire a "sort of instinct" that guides them. He tells of an engineer who was continually making narrow escapes, until colour-blindness was finally proved and acknowledged. This man afterwards declared that he had had nothing

definite to base his actions upon, but had been guided entirely by this caution and instinct.

The testing for colour-blindness is by no means so simple a matter as it might at first sight appear. It would be quite useless, for instance, to test an engineer with the flags and lanterns with which he has become familiar. Any test necessitating the naming of a colour is imperfect; a person may name the colour of an object correctly because he has heard that name applied to it, or has associated the name with some other quality of the object, though he has no conception of its colour.

Even the congenitally blind can usually give correctly the colour of the sky or of foliage. A person interested to conceal his defect might even intentionally deceive by making ingenious guesses founded on the intensity of the reflected light, or upon some other properties of the object. An amusing instance of the latter is related by Mr. Chapin, principal of the Pennsylvania Institution for the Blind. One of his former pupils, who was stone blind, asserted in the presence of a number of gentlemen that he could distinguish colour by the touch. When challenged to the proof, he passed his hand down the front of their coats and pronounced one blue, another black, and another gray; in each case correctly. The first coat had metal buttons, the second was of close texture and smooth surface and had covered buttons, and the third he recognized, from the cut of the collar, to be the coat of a Quaker.

A number of different tests have been proposed; the simplest and best is that used more than twenty years ago by Wilson, of Edinburgh, and recently revived by Holmgren. The person examined is directed to match different coloured worsteds. It is now very generally adopted in Europe.

As to the practical results of the agitation of this subject, Dr. Jeffries informs us that the Swedish, Russian, and Bavarian governments have ordered all persons connected with the railroads to be tested for colour-blindness; in Italy all railroad employes are subjected to rigorous examinations; and investigations have been, or are being made, on an extensive scale, in France, Belgium, Holland, Denmark, and Finland. In Finland, of 1200 employes examined, 60 were found colour-blind. Not much progress has been made in England, though Prof. Tyndall has added his warning to that given strongly twenty years ago by Wilson; but the subject is being discussed there.

In this country, so far as we know, absolutely nothing has as yet been done. It is to be hoped that Dr. Jeffries's pamphlet may direct the attention of those in authority to the very great importance of this subject.

The article on "Incurability of Congenital Colour-blindness" is a criticism on the views of Dr. Favre, of Lyons, who has been the only authority to advocate the possibility of curing it by systematic exercise of the eye with colours. It is shown that Dr. Favre has confused the knowledge of the *name* of a colour with the *ability to perceive* the colour. The author is confident that a colour-blind person can no more be taught to recognize the colour in which his spectrum is deficient than he can be taught to hear a note above or below the vibratory scale of his ear.

Those who desire to study the subject of colour-blindness will be thankful to Dr. Jeffries for the very copious and complete bibliography that he has furnished.

Delboeuf is himself a "Daltonian," and, in endeavouring to verify the Young-Helmholtz theory, it occurred to him that it might be possible that the atrophy of the red-perceiving elements was only relative, in the sense

that their action was masked by the preponderating action of the two other elements. Supposing this to be the case, it would follow that by interposing between the eye and external objects a transparent reddish substance he could "re-establish the equilibrium," since, in this way, the green and violet rays would be in part extinguished.

One of the greatest difficulties in the way seemed to be to determine the exact degree of coloration to be used, and, to overcome this, he decided upon a coloured liquid inclosed in a glass prism. This gave a degree of colour increasing gradually from angle to base. The colouring matter selected was a solution of fuchsin (magenta). The effect of looking through this, the author assures us, was marvellous. Not only did the colours which he habitually confounded—blue, carmine, and violet on the one side, and scarlet and brown on the other—appear decidedly different, but scarlet particularly assumed a brightness before unknown to him; while before it had appeared dull, it now became brilliant ("flamboyant et éblouissant"). The experience of a number of other Daltonians, upon whom he experimented, was the same.

The author claims that these experiments, if they do not entirely subvert the Young-Helmholtz theory, at least prove that the colour-blind owe their peculiarities of vision not to an atrophy, more or less complete, of the red-perceiving elements, but rather to a special susceptibility to the green and violet rays, or, more exactly, to the colour complementary to fuchsin.

It would seem, at first thought, that any red substance should produce the same effect as fuchsin, and that this effect could not be produced by any substance of another colour; but this was found not to be the case. Aniline violet, and eosine, which is orange, also corrected his Daltonism, though in a less degree; while a piece of glass, coloured red by oxide of copper, produced no other effect than to deaden all the colours except red.

This proved that the correction-property of the fuchsin was not dependent upon its colour; and when this substance was analyzed by the spectroscope, it was found that it extinguished the green region of the spectrum, and it only. The dark band was sharply defined, particularly on the side next the yellow.

Spectroscopic analysis of aniline violet and of eosine gave the same result, except that the dark band was less sharply defined, and its position was somewhat different. But the glass coloured with oxide of copper obliterated all the colours except the red.

The author thinks that if he has not completely proved, he has at least made it probable, that it is the presence of the whole or a part of the green (which may be suppressed by fuchsin) that renders certain eyes insensible to the complementary colours.

The next step was to attempt to produce Daltonism artificially in normal eyes by suppressing or enfeebling all the light but the green. After experimenting with a number of substances without success, chance again came to the rescue and threw chlorate of nickel in his way. Through a four per cent. solution of this substance, M. Spring, whose vision is normal, found violet to become blue, red to identify itself with brown, and nature to assume a dull and uniform aspect. The effect of this solution on the solar spectrum was to reduce it to a green band corresponding exactly to the gap that the fuchsin had made in it.

Daltonism, produced artificially by chlorate of nickel, was corrected by fuchsin; and natural Daltonism, corrected by fuchsin, was restored by chlorate of nickel.

As a physiological hypothesis, the author suggests the application to colour-vision of the "Theory of the natural equilibrium of the organs of sense," which he has advocated elsewhere, and which he calls the "Psychophysic law."

According to the wave theory of light, the different colours of the spectrum depend upon the different rates of vibration of the ethereal waves. If the number of vibrations for green be represented by 9, blue, indigo, and violet will be 10, 11, and 12; and red, orange, and yellow will be 6, 7, and 8. The retina is compared to a membrane set to a certain tone, but capable of being stretched or relaxed under the action of external forces; just as the vocal cords, though they manifest a certain preference for a special octave, can vibrate in unison with octaves above or below it. If the natural tension of the retina be supposed to be adapted to green, the sensation of green will result from the characteristic vibration of the membrane.

Designating by 0 the natural equilibrium of the retina corresponding to the number 9, which represents the number of vibrations for green, the series, beginning with violet and ending with red, may be expressed by $+3 + 2 + 1.0. - 1 - 2 - 3$.

"But, like all elastic substances, the retina tends to maintain itself at 0; it is not without a certain resistance that it takes the movements $+1$ and -1 ; its repulsion is more marked for the movements $+2$ and -2 ; and much more decided still for the movements $+3$ and -3 . Its inertia will be, in each case, reinforced by the presence of green rays which exist, in greater or less quantities in all complex colours. For the moment that the retina feels their presence, it will obey them, and its capacity to obey a different force will be diminished in proportion as the effects of this latter force are in part masked by the preponderating effects. Nevertheless, in normal vision this diminution will never go so far as to prevent the retina from receiving, or, if you will, from perceiving the extreme movements. But with Daltonians this is not the case; with some, it refuses to yield itself sufficiently to the movements $+3$ and -3 ; with others, to the movements $+2$ and -2 ; finally, there are, perhaps, some where it will not receive even the movements $+1$ and -1 . Hence we can readily conceive why these Daltonians are corrected, either by the interposition of fuchsin, which checks the auxiliary, or by the projection of purple light, which brings support to the insufficient forces."

This theory is ingenious and entertaining, but fanciful, and, perhaps, somewhat crude; indeed, the author himself speaks of it as merely a rough sketch, and excuses his departure from what he says might be a becoming reserve by the hope that his theory, even if false, may assist in directing others in the right path. At all events, he is on debatable ground where any one may build a theory, and hold it if he can.

The question naturally arises, supposing these views to be correct, why "Daltonians" should not distinguish the green of the spectrum. The author says this fact is analogous to the well-known phenomenon that artificial light (which has an excess of yellow) makes yellow objects appear white:—

"Any kind of light, when it is the only light, tends to appear white. It is thus that the photographer, in his chemical cabinet, which is lighted only by yellow light, does not see it yellow but white; it would be the same if the glass were blue or red. . . . With the natural Daltonian, as with him whose eye is submitted to general excitation by green light, the green may be unperceived or produce the effect of white light."

The last section of the paper relates to the possibility of curing Daltonism. Of this our author is by no means hopeless. He tells us that, after

having spent much time, during several months, in experimenting with the fuchsin, he noticed a decided change in the colouring of a favourite picture. Some time afterwards, while walking in the street at night, he distinguished the red light of a lantern placed, as a warning, over a breach in the culvert; and found that he could distinguish the red colour of a railway light which, lately, had not appeared to him different from an ordinary gas flame. He is here, again, ready with a theory, or rather considers this experience a confirmation of the theory already proposed. The fuchsin overcomes certain resistances by arresting the rays of light whose property it is to encourage and maintain these resistances, and he had subdued these so often in his frequent and long-continued use of the fuchsin that the nervous element of his retina had, as it were, acquired new habits and yielded more readily to the force of luminous impulses.

Delboeuf's experiments with coloured media remind one of Liebreich's London lecture on Turner and Mulready. Liebreich took the ground that the excessive blue in the later pictures of Mulready, who continued to paint after he was seventy years of age, was due to yellow degeneration of the crystalline lens; and maintained that this excess of blue could be neutralized, and these pictures could be restored to the harmony of the artist's earlier productions, by looking at them through a glass slightly tinted with yellow.

The observations of M. Delboeuf are new and interesting, and will, we believe, prove useful; for, though he is evidently not free from the bias of a favourite theory, and perhaps avails himself rather freely of the "scientific use of the imagination," he has worked ably and honestly and with great ingenuity in a difficult field of study, and his labours can hardly fail to, at least, excite renewed interest in this important subject.

It is one of those subjects which, though they may appear simple enough to the superficial glance, expand indefinitely as you penetrate them more deeply, and become more intricate the more you study them. It is involved in the wide and unsettled subject of colour vision, concerning which scientific opinion seems to be just now in a state of transition, and must remain in doubt so long as does the latter. We must have a theory of colour-vision before we can have one of colour-blindness.

Those who have the strongest faith in the "potency and promise" of the retinal red, discovered by Boll, will have most hope of the final settlement of these questions on a photo-chemical basis. The theory that all the phenomena of visual impressions are the result of changes effected in this colouring matter by the action of light is most attractive, and may contain the germ of the future solution of the whole matter. Its present status, however, is scarcely more than suggestive.

The question seems even more complicated when we remember that the sensation of light and the sensation of colour are the result of two distinct functions. In some observations recently communicated to the French Academy of Sciences by MM. Landolt and Charpentier, it was shown that "the luminous sensation is the reaction, simple, primitive, essential, constant, of the visual apparatus; the sensation of colour is a reaction, secondary, inconstant, variable, according to the point of the retina considered, and according to a number of experimental conditions." The chromatic sensibility may vary independently of the luminous, and the luminous may vary under certain conditions, while the chromatic remains constant. Indeed, these conclusions do little more than formulate familiar facts of every-day experience; the colour-blind may have more

than the average acuteness of vision for form, and we not unfrequently meet with persons who have not vision enough to go about alone, but who can still distinguish colours.

A large portion of the retina is normally colour-blind, the whole spectrum is seen only in the central portion around the macula lutea; beyond that the perception of red disappears, then that of green, and finally, at the periphery, the sensibility to blue only remains. According to Dobrowolski, the limit for the sensibility for red is 80° from the fovea, for green 95° , and for blue 105° , the extent of the visual field. This is on the inner side of the retina, on the outer side the limits are 65° , 73° , and 77° . These conditions are frequently modified by disease.

According to Geiger, Magnus, and others, what would now be colour-blindness was the normal condition of our remote ancestors; the sensibility to colours enjoyed by the present generation is the hereditary result of education prolonged through many generations; in other words, the colour sense has been developed by a process of evolution. This theory, advanced some years ago by Geiger, who has since died, has been recently developed at considerable length by Hugo Magnus, Professor of Ophthalmology in the University of Breslau. Magnus divides the colours of the spectrum into three classes: those richest in light, red, orange, and yellow; that which has a medium degree of luminosity, green; and those which are feeblest in light, violet, indigo and blue; and argues ingeniously and learnedly to show that the advancing ages acquired each in turn. He maintains that primitive man possessed only the sense of light, that red was the first and violet the last colour to be recognized, and that it is not impossible that our descendants may acquire the appreciation of colours that escape the present generation. Geiger stated that the Rig-Veda contained no mention of green, blue, or violet, and similar statements have been made of the Koran and the Bible. Magnus says that Xenophen saw only three colours, red, purple and greenish-yellow, in the rainbow, and that the Homeric poems belong to the same colour-period, as they confound green with yellow. The mention of the Homeric age brings to the front Mr. Gladstone, who fully adopts the views of Magnus, and shows that Homer perceived red and yellow, but confused green with yellow and blue with black.

We refer to this theory, as briefly as possible, merely because it has been extensively discussed, both in and out of the profession, and forms an interesting, if not very important, chapter in the literature of our subject. The objections to it are numerous and obvious. As the proofs adduced are entirely of an historical character, there is the probability of confusing the names of colours with the colours themselves, and, therefore, the means of expression with the power of perception. M. Delboeuf has called attention to the fact that we, even now, have no special designations for odours, and our nomenclature for the various and precise sensations of hearing is very incomplete. Sterner scientists have objected to going to poets for scientific data, even leaving out of consideration the possibility that Homer may himself have been colour-blind. The assertions in reference to the Rig-Veda and Koran are, so far as we know, unchallenged, but it is stated in a recent communication to the *Philadelphia Ledger* (July 26), that blue is mentioned nine times and green or greenish forty times in the Bible. Looking back beyond man on the scale of development, numerous experiments have demonstrated the recognition of colours by the lower animals; not to go more deeply into this subject, any

farmer's boy can testify to a lively appreciation of red on the part of an excitable bull.

M. Javal has taken up the gauntlet, and, avoiding any imputation upon his progressiveness, has boldly accepted the theory of evolution, and pushed it to a conclusion diametrically opposite to that of Magnus. He says there is no reason to suppose that the longer but less numerous waves of the colours towards the red end of the spectrum should excite the retina more powerfully than the shorter but more frequently repeated waves at the other end. On the contrary, the analogy of hearing points in the opposite direction. (The fact that while the perception of red is confined to a circle of the retina around the macula, blue is perceived throughout the whole visual field, may be of interest in this connection.) It is known that the eye is not an achromatic instrument, and that, therefore, if the less refrangible red rays are focussed accurately upon the retina, the more refrangible violet rays must be focussed in front of it, and fall upon it in circles of diffusion. The eye, therefore, accommodates itself for an intermediate distance so that the red and violet circles of diffusion may be made too small to create confusion.

If evolution should add another colour beyond the violet, accommodation would become more difficult, the circles of diffusion larger, and vision less accurate. This would be to sacrifice the useful to the agreeable. If the coloured rays of the spectrum are intercepted, the invisible ultra-violet rays become visible. These rays are suppressed, or rather neglected, in the interest of accurate vision, as every visual sensation is, that would be injurious to the perception of external objects. "Then, contrary to the views of M. Magnus, *progress*, in the domain of vision, should rather consist in restricting than in increasing the extent of the scale of colours. *Pourquoi pas?*" Why not? indeed, just as we have got rid of the tail of our fathers.

G. C. H.

ART. XIX.—*Visions: a Study of False Sight (Pseudopia)*. By EDWARD H. CLARKE, M.D. With an Introduction and Memorial Sketch by OLIVER WENDELL HOLMES, M.D. 16mo. pp. 315. Boston: Houghton, Osgood & Co., 1878.

THIS book comes before us under remarkable circumstances. The author, who recently died at the age of 57, had reached a foremost place in his profession and in the respect and consideration of the community in which he lived and died. Few men have combined in a higher degree a well-earned professional eminence with large general culture, and morals and manners that recalled the best type of the gentleman. With a large practice, studious habits, and habitual association with thoughtful men, he was well prepared to ponder the questions which his profession was constantly presenting, in a purely philosophical spirit. If he made no great achievements in original investigation, he had the scarcely less valuable merit of measuring the claims of others with profound insight and a judicial impartiality. His *Sex in Education* and *Building of a Brain* are admirable examples of a broad observation, keen analysis, and dispassionate judgment. In the very maturity of his powers, with many more years before him, apparently, of an honorable career, he became the victim of a pain-

ful, malignant disease, and in order to divert his mind from his sufferings, he engaged in a course of inquiries the result of which we have in the volume before us. When disabled from using his pen any longer, his wife made the record of his progress, until she on whom he also relied for help and comfort in the still darker days that were at hand, was removed by sudden death, when the final offices of affection devolved upon his daughter. After his own death, the manuscript was consigned to his friend, Dr. Oliver Wendell Holmes, who had visited him often during his illness, and discussed with him the subjects of his investigation, to be disposed of as he might think best. We are glad that, though unfinished, he did not hesitate to publish it, making no changes in it, he says, of any importance, and no additions to it whatever. The reader is not to expect an elaborate, well-rounded treatise, such as it undoubtedly would have been had the writer's life been spared a little longer. He will have, however, a highly philosophical essay full of careful analysis, ingenious suggestions, acute reasoning, with many interesting cases. Dr. Holmes introduces the book with a brief account of the author's life and character, which, while glowing with the warmth of friendship and admiration, is none the less, we believe, a correct appreciation of those qualities of mind and heart which led to his professional reputation, and have endeared his memory to those who knew him well.

Dr. Clarke's attention seems to have been drawn to this subject by some striking original cases of hallucination of sight unaccompanied by delusion, or mental aberration. His purpose was to furnish an explanation of these phenomena in accordance with the accepted facts of anatomy and physiology and the analogies derived from recent revelations in physical science. The problem to be solved is, by what process does a person clearly perceive a sight or a sound which has no objective existence. The first step towards a satisfactory solution is to ascertain the process by which ordinary, normal perception is effected. "The apparatus of human vision," he says, "may be described as a mechanism consisting of five organs, or sets of organs, which are closely connected, and in intimate communication with each other. They are: (1) the eye, with the iris, lenses, retina, and other structures which belong to it; (2) the tubercula quadrigemina and associated nerves; (3) the cerebral centres of vision in the hemispheres, probably the angular gyri; (4) the gray matter of the frontal convolutions; and (5) the connecting nerves of communication." Each member of this apparatus has its special function. "Each one is supposed to do its own part or duty honestly; that is, never to send a report to a station above which it has not received from below; and in the vast majority of cases, such is the fact. . . . Nevertheless, modified by disease, disturbed by drugs, or influenced by the brain itself, they sometimes play false, manufacture news, like politicians and speculators, and send untrustworthy reports to headquarters." The functions of these several members and the successive steps in the process may be briefly stated thus. The eye receives the impression of the waves of light, with the colour, form, size, distance, and other qualities of the object impressed upon it, but its action is purely automatic or mechanical. By means of the optic nerves, something, called by the author a visual impression, is transmitted to the tubercula quadrigemina which are charged with the duty of coördinating all the automatic muscular movements, whether of the eye, or any part of the body, concerned in the act of seeing. Of all this, report is made to the angular gyrus, "which is the last centre or station of the apparatus which visual

impressions traverse on their way from the external world to the frontal lobes where they are turned over to the machinery of ideation and volition. In this centre they receive their final elaboration before being presented to the mind; here they are accurately registered and preserved for revival or reproduction. . . . It recognizes, pictures, and notes, every shade of visual difference. . . . Whatever report it sends up the mind accepts as true. In the vast majority of cases, it justifies by its truthfulness the confidence reposed in it. Were it not so, we should never be sure of anything we see. . . . Now and then the angular gyri do act independently of the external world, and then we are amazed and confounded by their doings." From the angular gyri the visual impression is transmitted to the frontal lobes "where it is transformed into an idea." This is perception. In another place the process is stated thus: "When light waves from an uplifted dagger fall on the retina, the eye records the facts of colour, size, position, motion, etc., and transmits an account of them to the tubercula quadrigemina. This centre carefully adjusts the mechanism of the eye, the iris, lenses, muscular apparatus, and the like, to the demands of careful observation, coördinates the general muscular system for any movement the exigency may require, and makes its visual report to the angular gyrus. The latter centre receives the report, perceives all the details of the dagger, the hand grasping it, the face and action of the owner, whatever constitutes an exact picture of the scene, and transmits a corresponding pictorial report to the frontal lobes. Upon receiving this report—this pictorial representation—the lobes *look at it*, ascertain its significance, determine whether the uplifted dagger is raised for inspection merely, or for a threatened or real plunge, or for other purposes, communicate with the instincts and emotions, and decide the will to act." The cells of these nerve-centres are supposed "to retain or register impressions." Ferrier, whose statement Dr. C. quotes approvingly, says, "the angular gyrus is, like the sensitive plate, recording in cell modifications the visual characters of the object looked at." "And just as the chemical decomposition effected by the rays of light may be fixed and form a permanent image of the object capable of being looked at, so the cell modifications which coincide with the presentation of the object to the eye, remain permanently, constituting the organic memory of the object itself." They can also be reproduced "under the influence of an appropriate and sufficient stimulus," and the oftener they have been formed, the more easily and accurately do they arrange themselves in the same order. This effect is also facilitated by force of association and habit. Cell-groups which have been dormant for years may be called into activity in quick succession, by any incident which revives only one of them. Considering the many millions of nerve-cells in the ganglionic centres, there can be no lack of room for such registrations as long as life endures.

Such very briefly is Dr. Clarke's account of the manner in which we see, expressed as far as possible in his own words. While it does not conflict with the most approved results of recent inquiry, we scarcely need to say that it is not in any degree the fruit of original, experimental investigation, nor indeed can it be considered as a thoroughly scientific deduction from facts brought to light by others. He admits that it is largely hypothetical, and we readily admit that it may claim the merit of being a rational, scientific conjecture ably and gracefully supported. The processes which lead to intelligent vision are closely affiliated by Dr. Clarke to those of electro-magnetism, and photography. He adopts the language specially

used in those sciences in order to convey his views of the cerebral action concerned in this function. Indeed, without them he very probably would have never undertaken to throw fresh light on the mechanism of vision. One can hardly help being impressed by the apparent analogies which modern discovery has disclosed between some branches of physical science and the functions of the nervous system. It requires no great stretch of imagination to see in the telegraph wire and the nervous fibril a similarity of office, or to see in the stores of negatives laid by in the pigeon-holes of the photographer's room the counterpart of that immense congeries of cell-groups containing the recorded impressions of a life. We have no wish to depreciate the aid thus obtained in the study of the nervous system, so long as we are careful not to mistake a means for the end. A nerve is not exactly like an iron-wire, nor a group of cerebral cells much the same thing as a bundle of sensitive plates. Future discoveries may clear away some of the obscurity in which these analogies are involved, and thus give a surer, broader foundation for this particular correlation of forces. Indeed, since this book was written, the discovery of the phonograph, whereby sounds are registered and preserved for future use, establishes another analogy between cerebral and mechanical dynamics.

We have admitted our author's explanation of the sense of sight to be a rational conjecture, and to some extent it is certainly a strictly scientific deduction. The eye receives a picture of the object representing its various qualities, such as form, size, colour, etc., though the Doctor's language leaves us in some doubt whether he regards the perception of these qualities as an original, primitive power, or, with most physiologists, as the result of education and experience. Thus far we have only a picture, and to make it practically available the eye is endowed with various muscular powers whereby it is adapted to the varying circumstances of the light. Without this power it would be an imperfect instrument of sight, and none the less so without a power somewhere of coördinating the movements implied in it. This office is given to the tubercula quadrigemina, and thus another stage of the process is accomplished. Thence the impression is conveyed to the angular gyri on the cells of which it is inscribed and where it becomes cognizant to the frontal lobes, the source of true perception. This statement, in which he follows the conclusions of recent inquirers, furnishes Dr. Clarke an explanation of the phenomena of false vision, or *pseudopia*, as he terms it, that would have been unattainable under the Berkleian theory of vision. Pseudopia is a phenomenon strictly analogous to that well-known fact of sensation in a limb, days or weeks after its amputation, and here Dr. Clarke finds the clew to his own explanation. In the one case as in the other, a movement in any part of the apparatus concerned in the function may be transmitted to the cerebral ganglia, there exciting a perception which by force of habit refers the movement to its customary objective source. As our author puts it, "a vision is produced wherever the cell-groups indicating that vision—its hieroglyphic or cipher—are formed in the brain, whether they are formed normally by the stimulus of light-waves from an external object, or abnormally by a stimulus initiated intracranially." He describes several forms of pseudopia arising from different cerebral conditions, being provoked sometimes by an abnormal habit like somnambulism and somnolentia; sometimes by active cerebral disorder like delirium tremens; sometimes by febrile excitement the result of colds, or influenza; sometimes by anxiety and mental strain; sometimes by stimulants; sometimes by an act of volition aided

by habit, association, and emotion. And the starting point may be a shadow or other objective stimulus, or it may be intracranial, entirely subjective. Whichever it may be, "it initiates a customary sort of motion in the visual apparatus, which determines the apparatus to produce of itself, automatically, the cell-groups and modifications that are to go through an habitual action representing some external object." It would greatly exceed our limits to give Dr. Clarke's comments on all the cases he describes, and therefore we must confine ourselves to a notice of one or two only.

Mrs. B., a lady thirty years old, experiences a hallucination when about to suffer some sort of febrile attack, like a cold or simple fever, or gastric derangement, and it disappears when the attack is fully developed. Suddenly there appears to her the figure of a woman with averted face, dressed in white, coming unbidden at any time of day or night, sometimes sitting, sometimes standing, and sometimes walking. Once when dining out, as she approached the place assigned to her at the table, she found the chair occupied by her "familiar spirit." She thrust her fan into it, when it moved aside and vanished. "It will sometimes take a chair and sit near where she is reading, or at work, or by her bed, by the half-hour or hour together, and then vanish suddenly." "It would be impossible," says Dr. Clarke, "to gather from her account the details of the process by which old and disused cell-groups were so completely revived. All the conditions, however, for the production of pseudopia were present. She was naturally endowed with an excitable and nervous temperament. She witnessed in childhood an occurrence—a death—under circumstances of distress and horror, such as are seen by few, and which made a profound and permanent impression upon her. Her emotions were excited, at the time, to such a degree, that she could never afterwards allude to the event without distress. Later in life she became subject to the febrile attacks just mentioned, which were attended with slight cerebral congestion. At such periods the brain cells, including those of the visual apparatus, were temporarily flushed with blood, and therefore just in the state to be called into activity by the slightest stimulus."

In the case of a very similar hallucination which we met with, three or four years since, the subject, a middle-aged lady, the predisposing causes were an excessively nervous temperament raised into a morbid activity by domestic troubles and malarial exposure. At the periods when she suffered most, she would see, when she awoke in the morning, a woman unknown to her sitting at the foot of her bed. After a few minutes the apparition would rise and glide through the side of the room. Dr. Clarke relates, among others, the case of an old man whose hallucinations were both optical and auditory. He saw three persons in his bedroom, habited as public singers usually are, who entertained him with excellent singing, between the pieces chatting with one another in Italian. They appeared but once. "He was an ardent lover of music, and a frequenter of concerts and musical entertainments. During a long life his brain cells had been often grouped at the sound of music, and at the sight of musical performers." There was some cerebral congestion, and he finally died of brain disease. Under such conditions, favourable as they were to functional derangement of the nerve centres, "the slightest stimulus would be sufficient to put in motion the whole, or a part of his intracranial machinery. While sleeping, the notes of a serenade, or the whistling of a boy in the street, or even the excitement of a dream, would be enough to arouse his automatic cerebral

apparatus into musical activity. . . . His visual and auditory centres had acquired the habit, on musical matters, of acting together." The incidental parts of the hallucination, such as the dress of the performers, the preliminary clearing of the throat, and talking between the pieces, were all repetitions of a familiar experience. "Groups of old visual and auditory cells moved in and out of his field of seeing and hearing, and were telegraphed to his ideational centres, as honest reporters of objective sights and sounds."

In all the cases described by Dr. Clarke, the apparition was preceded by some nervous disturbance; but though this is unquestionably the general rule, yet we apprehend it is not without exceptions. A case once came to our notice the subject of which, an elderly physician, we know, on the best possible authority, had experienced no unusual exercise of mind or feeling, nor had his attention been particularly drawn to any thing directly or indirectly connected with the subsequent occurrence. On his way to the summer residence of a friend, he observed, when within a hundred feet of the house, a lady without bonnet or shawl passing along by the side of the house towards its front, which was not within sight from the approach until the visitor nearly reached it. He expected, of course, to meet her on the piazza, but found no one there, nor was there any appearance of the house being occupied. A few moments after, he met the gardener at work near by, who told him that Mrs. S. was very ill in the city, that none of the family had come down, that the house had not been opened, and that no one, man or woman, had recently been on the grounds. We are not sure how it will affect the *spiritual* faith of such people as believe in the *night side of nature* class of books, to be told that Mrs. S. did not die till nine or ten hours afterwards, but such was the fact.

We have now given the reader a clew to Dr. Clarke's philosophy of vision, true and false; and though we are not prepared to give our assent to it in every particular, we are willing to admit that, resting as it does on the latest researches in cerebral physiology and discoveries in other sciences, it is ingenious, rational and plausible, if not entirely satisfactory. At any rate, we believe that the legitimate influence of the book on some popular doctrines of our time will be good, for at the least, it will show how little foundation they have in the truths of science. It knocks away one of the strongest pillars of spiritualism, for what better evidence could it have than the testimony of the senses? When some shadowy spectre bearing the lineaments of a departed friend, glided into the room and sat down by the side of the observer, was he not bound to regard it as a visitor from the spirit world? The subjective character of apparitions has been recognized by scientific men, but it has never been a part of the popular belief; and even those too well informed to believe in ghosts could give no better explanation of them than to refer them to some unintelligible play of the imagination. We may add that few are aware how much in the mental operations of common life the subjective is mistaken for the objective, and yet the close observer, once cognizant of the fact, cannot fail to see it frequently exemplified. It explains very much of that discrepancy in the testimony of witnesses in courts of justice, which surprises and perplexes all who hear it. To this source undoubtedly, we must attribute most of those confessions of criminal acts which never had an objective existence. A person strongly impressed by the story of a crime, dwelling curiously on its circumstances, and forming pictures of the scene, and especially if he is of an excessively nervous temperament, becomes, at last, the subject

of a reflex movement whereby he is made the actor in the scene. A notable illustration of this phenomenon is given by Southwood Smith in his book on *Forensic Medicine*. A mutiny occurred on board an English national ship, ending in the murder of the captain, Pigot. The crew took the vessel into a foreign port where some of them were arrested, sent home and executed. The rest of the story is thus related by Mr. Finlaison, the government actuary, who was then employed in the Admiralty. "In my own experience I have known, on separate occasions, more than six sailors who voluntarily confessed to having struck the first blow at Captain Pigot. These men detailed all the horrid circumstances of the mutiny with extreme minuteness and perfect accuracy ; nevertheless, not one of them had ever been in the ship, nor had so much as seen Captain Pigot in their lives. They had obtained by tradition from their messmates the particulars of the story. When long on a foreign station, hungering and thirsting for home, their minds became enfeebled ; at length they actually believed themselves guilty of the crime over which they had so long brooded, and submitted with a gloomy pleasure to being sent to England in irons for judgment."

Dr. Clarke alludes to the visions of sleep, of the dying, and of the insane, but says only enough to lead us to regret that the opportunity had not been afforded him to make these also the subject of a special investigation.

I. R.

ANALYTICAL AND BIBLIOGRAPHICAL NOTICES.

ART. XX.—*Transactions of the American Gynæcological Society*. Vol. II.
For the year 1877. 8vo. p. 697. Boston: Houghton, Osgood & Co., 1878.

It will be impossible within a reasonable space to give even a condensed *résumé* of the various papers in the very creditable volume before us; we shall therefore confine our remarks to such of them as are most novel and instructive. As the Society numbers but forty-six active Fellows it shows how much valuable work may be done by a few working members. The last annual meeting was held in Boston on May 30, 31, and June 1, 1877; the next will have closed in this city before this issue of the Journal shall have appeared.

Amputation and Excision of the Cervix Uteri; their Indications and Methods.—In this paper Dr. JOHN BYRNE, of Brooklyn, N. Y., advocates the removal of the cervix generally in cases of cancer, "whether the disease be confined to a small portion of the lip only, or the entire circumference of the cervix be involved." He recommends the same method in many cases of "great enlargement from cervical hypertrophy, especially those met with in the lower and middle walks of life; in hypertrophic elongation of the cervix, and in aggravated granular conditions of the cervix, and cystic degeneration. He prefers the galvano-cautery for the ablation, and says that he has never had a case of hemorrhage after the removal of a hypertrophied cervix. The time required "should seldom be less than ten, and often fifteen minutes." He claims that cicatricial stenosis is rare after this form of removal, having seen but four cases in nearly fifty operations. He also states that the galvano-cautery exercises a restraining effect upon the growth and return of cancer of the cervix, and that in several cases reported, cures had apparently been effected, as there had been no return in periods varying from two to seven years.

Dr. Goodell had removed the cervix more than thirty times, and the only fatal results had occurred after the galvano-cautery; one died of peritonitis in forty-eight hours, one of secondary hemorrhage on the twenty-first day, the second attack, and the third died also after two hemorrhagic seizures. Dr. G. had never seen cicatricial contraction of the cervix to the extent of occlusion after the ablation. He advocated the use of the galvano-cautery as the preferable method of excision. Dr. Goodell believes that the cachexia of cancer has no special connection with its specific character or malignancy, as it may be made to disappear under a treatment temporarily arresting the growth and discharge, although the constitutional taint may remain in force.

Dr. John Scott, of San Francisco, took exception to the treatment recommended in the paper, and stated that his experience had taught him just the contrary. He advocated excision for cases of epithelioma, but deprecated it in other forms of cancer, or in the disease in advanced stages; he believes the operation to be a fruitful source of stenosis.

Dr. W. H. Byford believed in amputation of the cervix for malignant disease. He thought cancerous cachexia was due to a species of septicemia resulting from the disintegration of the tissues and absorption of the poison, and that death also resulted in this way; hence he advocated the removal of the decomposing mass.

Dr. Noeggerath had amputated the cervix forty-one times, all but six by the galvano-cautery; secondary hemorrhage in two of the former; eighteen cases were malignant; in eight there had been no return, one being of six years' standing and another four. In seven cases pregnancy subsequently occurred. Constriction of the os resulted in one of the thirty-five cautery removals, but was cured by pregnancy and delivery a year afterward.

Dr. JOHN C. DALTON, of New York, presented a *Report on the Corpus Luteum*, which is beautifully illustrated with twelve chromo-lithographs of ovaries, presenting the various conditions in which the yellow body is found. Dr. Dalton prepared the article at the request of the Society, the specimens being furnished in answer to a circular sent to professional friends. There were thirty-two pairs of ovaries, eight of which were removed from non-pregnant women within the four weeks of a regular menstrual interval, six after an interval of from five to eleven weeks, six in which the menses had been absent from four months to a year, and two pairs after an interval of six years or more. There were also four cases of abortion from third to sixth month; and six of death from one to eight days after delivery at or about full term.

We have been particular in noting the material used, as it will be impossible to condense the reports of the cases, which are very minutely described. To show the progress of development and recedence, Dr. D. gives the weights of the corpora lutea in the eight cases observed soon after menstruation, viz., 2 days after, 380 milligrammes; 9 days, 430; 10 days, 810; 15 to 20 days, 1230; 20 days, 1200; 6 weeks, 90; 10 weeks, 20; and 11 weeks, 15 milligrammes.

Case XVII. deserves especial notice, as an evidence that *menstruation may take place without the rupture of Graafian follicles, or formation of corpora lutea*. The subject was a young epileptic girl who died after sixteen hours' illness, eight days after a moderate menstrual flow, verified by personal inspection of the nurse in a hospital, where she had menstruated at regular intervals on two former occasions. The ovaries were normal in size and appearance, the right showing an enlarged and prominent follicle, with a transparent covering, as if approaching the menstrual maturity. In neither ovary were there any of the usual physiological changes that follow the menstrual period. Dr. Dalton expresses the opinion that the coincidental ovarian development was about to commence shortly in this case; and that the same want of coincidental action between the flow and follicle may occur at the closing of menstrual life.

As diseases necessarily retard or modify the menstrual function with its ovarian changes, the most reliable observations must be those made after death by violence; in which event the previous history is often wanting, so that the valuable cases must be exceedingly limited. The well-known accuracy of Prof. Dalton makes his paper a very valuable contribution to obstetric science.

The Pathology and Treatment of Puerperal Eclampsia is the title of a paper by Prof. OTTO SPIEGELBERG, of Breslau, Prussia, in which he controverts the theory of Frerichs, that urea is changed in the blood into carbonate of ammonia, and that this becomes the cause of convulsions. He found ammonia present in the blood in three cases, but only in minute quantities, and believes it to be one of the rarest causes of convulsions.

He also opposes the theory of Traube and Rosenstein, that the eclampsia results from increased arterial pressure, producing acute œdema of the brain in hydremic subjects, ending in coma, the fact being that hydremic women are not specially subject to convulsive attacks.

Prof. S. attributes the eclampsia to the want of renal action, whereby the urea accumulates in the blood to a poisonous extent. He believes that this failure of the kidney is due, not to mechanical congestion, unless it be in a few exceptional

cases, but to some defective condition of the minute bloodvessels of the kidney, whether to degeneration of their walls or spasmodic contraction he is not prepared to say. Eclamptic or epileptiform attacks also result from reflex disturbance originating within the pelvis, from an over-distended bladder or an irritable os uteri.

Treatment.—Prophylactic—where there is kidney trouble, employing alkaline diuretics, vegetable acids, purgatives, tonics, and warm baths. Where there are premonitory symptoms, venesection, chloral by rectum, morphia hypodermically. Induction of premature labour not recommended. In true eclampsia he recommends venesection as the most reliable means of relief—6 ounces in ordinary cases, and 15 or 16 in robust women, the bleeding being repeated if not effectual. Narcotics immediately after the venesection, muriate of morphia, chloral, chloroform not safe, but may be given during a paroxysm; cold applications to head, and local depletion, in coma; a full dose of calomel and jalep, followed by an enema of ol. ricini and ol. terebinth., $\bar{a}\bar{a}$ f $\bar{z}$ ss, in chamomile tea. The speedy completion of labour is also highly important.

Dilatation of the Cervix Uteri for the Arrest of Hemorrhage is the title of a paper read by Dr. G. H. LYMAN, of Boston, Mass. As menorrhagia is a very common ailment in our country, any truly philosophical method of relief must be of great value. Dr. Lyman believes that in large measure the cause of metrorrhagia lies in a uterine congestion, produced by strangulation of the circulation at the internal os uteri, and to relieve this, recommends the wide dilatation of the cervix by means of sea-tangle tents. He gives five typical cases to show the marked benefit of the treatment.

In No. 1 the hemorrhage was very profuse; dilatation revealed the existence of a fibroid at the internal os; no other complication; next menstrual period no excess; third slight increase; woman being 48, then ceased to menstruate; fibroid diminished, and health became re-established.

No. 2 was single, and 28; subject to exhausting metrorrhagia, which was liable to seize her under any emotional impulse or muscular effort. Uterus of normal length and in place; patient affected with vaginismus, which was first treated; dilatation of uterus revealed nothing abnormal, but resulted in her menstrual periods becoming finally regular and normal.

No. 3, 27, married three years, never pregnant; uterus enlarged to three and a half inches in length, dilated with tents; small portions of hypertrophied mucous membrane removed with curette, and tincture of iodine applied. Case much improved; uterus diminished to nearly normal size, and flow decidedly checked, although not perfectly, as the circumstances of the patient would not admit of the required rest and treatment.

No. 4, 36, married 15 years, one child, has had leucorrhœa two years, menorrhagia 3 weeks out of 4, for about nine months, and confined most of the time to bed. Uterus dilated, no fibroids, walls thickened, with pulpy masses in the cavity, considerable masses of hyperplastic mucous membrane removed with placental forceps, no hemorrhage or constitutional disturbance, carbolized vaginal injections used, and Bland's pills. Next menstrual period lasted six days, profuse on third day, but not menorrhagic. Two years and a half later, occasional slight prolongation of periods, looks and feels well, not been confined to bed a day.

Dr. D. H. Storer, of Boston, mentioned two cases in which very marked relief from menorrhagia had followed the use of the sponge-tent. Dr. Wilson of Baltimore had frequently observed the same effect.

Dr. Albert H. Smith, of Philadelphia, had repeatedly used the sponge-tent to relieve certain forms of metrorrhagia; especially where there existed a granular endometritis, associated with hyperplasia of the body of the uterus; and to cause a diminution of uterine enlargement, resulting from inflammatory hypertrophy, or imperfect involution. He cautioned the Fellows against using the tent in cases

of possible malignancy, and reported one where this condition not being suspected, he had by the dilatation caused a rupture of the uterus. He recommended the use of one large-sized sponge-tent, capable of expanding to a diameter of from one to two inches, and introduced from a half to three-quarters of an inch through the internal os, there to remain forty-eight hours. He regarded the use of one tent as fraught with little danger, the fear being from a repetition, after the withdrawal of the first. To avoid any septic trouble he recommended an injection of 2 gr. permanganate of potash every three hours, which the sponge would be found on removal to have absorbed.

Dr. Scott, of San Francisco, spoke of the danger of the use of the tent in acute or subacute cellulitis. He recommended after the removal of the tent, in metrorrhagic cases, that the uterus should be washed out with water at 110° to 115° and then tincture of iodine injected.

Dr. Goodell, of Philadelphia, believed that sponge was also useful, from the fact that it withdrew in its meshes small polypi and portions of the hypertrophied lining membrane of the uterus, the existence of which favoured the hemorrhagic tendency.

In a paper on *The Principles of Gynæcological Surgery applied in Obstetric Operations*, Dr. A. J. C. SKENE, of Brooklyn, New York, recommends the use of the Sims speculum in dangerous and difficult obstetric operations, so that by the advantage of sight, better security against injury may be obtained. In craniotomy he places the patient on her left side; introduces a large speculum; supports the anterior vaginal wall and uterine lip by a retractor; uses Braun's perforator, cutting several openings, and removing the intervening plate; removes the brain with a curette, and long-handled sponge; separates the scalp from the skull by a uterine sound, and then picks away the cranial bones, etc.

In prolapse of the funis, he uses the speculum in the knee-elbow position, pushes up the cord with sponges in long holders, and secures the advantage gained by descent of the head, replacing the patient on her side during the pain.

Dr. Skene has also applied the fillet to breech presentations, and uses Barnes's dilator with much advantage, by using the speculum; and suggests its employment in shoulder and arm presentations.

Dr. WILLIAM T. LUSK, of New York, read a paper *On the Necessity of Caution in the Use of Chloroform during Labour*, in which he expressed his belief that "not a small number of persons have quietly abandoned chloroform as a pain-stilling agent, because some incident in their practice has led them to suspect that in spite of statistics it possesses dangerous properties." (Page 203.)

The author divides his subject according to the following heads: "1st. *Deep anæsthesia, carried to the point of complete abolition of consciousness, in some cases weakens uterine action and sometimes suspends it altogether.*" By this effect we secure the required muscular relaxation where version is to be performed; but after turning, this very condition should be regarded as a dangerous obstacle to the immediate removal of the fœtus, the inertia of the uterus endangering hemorrhage; hence the importance of waiting the removal of action, by the diminution of anæsthesia. We have especially noted this effect in many cases of labour under ether.

"2d. *Chloroform, even given in the usual obstetrical fashion, namely, in small doses, during the pains only, and after the commencement of the second stage, may, in exceptional cases, so far weaken uterine action as to create the necessity for resorting to ergot or forceps.* I think, if statistics were to be gathered together on this point, it would be found that those who habitually use chloroform in normal labour resort to forceps with somewhat increased frequency." (Page 205.) An inquiry would no doubt also establish the fact that this adynamic effect

in sulphuric ether in labour, was the main cause of the large falling off in its use, the objection coming both from obstetrician and patient.

"3d. *Patients in labour do not enjoy any absolute immunity from the pernicious effects of chloroform.*" It has been so strongly contended, particularly in Great Britain, that parturient women enjoyed a special immunity against the dangers of chloroform, that this heading throws down the gauntlet to many of our trans-Atlantic medical brethren. Dr. Lusk, however, is ready to back up his opinion with cases in proof, of which he gives five, all the patients being free from cardiac or pulmonary complications.

CASE I.—22, married, second pregnancy, brought to Bellevue Hospital in labour, shoulder presentation, and prolapsed funis, which had ceased to pulsate. Dr. Lusk saw her ten hours after rupture of membranes. Squibb's chloroform given to relax uterus in aid of version, patient struggled, assistant closed the funnel over the respiratory passages, and "almost instantly the patient ceased to breathe, and became pulseless." After being with difficulty resuscitated, it was found that alarming symptoms were reproduced by the slightest inspiration of the anæsthetic; the woman was strong, healthy, and free from lung or heart affection.

CASE II.—Primipara, 30. Chloroform in second stage, and only during pains; had been given over two and a half hours, and but a few drops at a time, when the patient after half a dozen deep inspirations suddenly ceased to breathe, and her pulse ceased. Dr. Joel Foster, who was in charge, used Marshall Hall's method, and she was restored. The total amount of chloroform used in the two hours and a half was less than half an ounce.

CASE III.—Same patient in a second confinement. A little chloroform given by Dr. Elliot on a handkerchief during pains; same effect as before; same method used, and same fortunate result. Labour completed without the anæsthetic, and patient did well.

CASE IV.—Primipara, 22, under care of Dr. Cotting. Head about emerging when slight convulsion took place. Chloroform given, and repeated during returning pains; tremor occurred and pulse ceased. No cause of death found except the giving of chloroform.

CASE V.—Multipara, 25. Shoulder presentation; labour protracted. Chloroform given preparatory to version, under direction of a sister of charity in charge of the hospital ward. As patient did not rouse after inhalation, surgeon called in, who found a thready pulse, face blue, and respiration imperfect. In ten minutes the woman died.

"4th. *Chloroform should not be given in the third stage of labour. The relative safety of chloroform in parturition ceases with the birth of the child.*"

Dr. Lusk believes the use of chloroform dangerous, in cases of hour-glass contraction, placental retention, and where the perineum is to be sewed up, as the uterine relaxation induced favours hemorrhage. He advises against the use of the anæsthetic in cases where there has been hemorrhage to any considerable extent, even if a day has intervened, the cerebral anæmia increasing very materially the risk.

"5th. *The more remote influence of large doses of chloroform during labour, upon the puerperal state, is a subject that calls for further investigation and inquiry.*"

When the system becomes as it were saturated with chloroform, to be removed by an eliminative process, the secondary depressive effect of the anæsthetic may endanger the life of the woman, especially if she has become anæmic by reason of post-partum hemorrhage.

The Present Status of the Intra-uterine Stem, in the Treatment of Flexions of the Uterus.—In this paper Dr. ELY VAN DE WARKER, of Syracuse, N. Y., endeavours to disabuse the minds of medical men of what he conceives to be an error, in regard to their estimate of the risk of using the stem pessary in the treatment of uterine flexures; and to revive a resort to the same, as a needlessly abused

instrument. Thirty years' experience has not proved very favourable to the employment of this apparently simple and philosophical little appliance, which physicians were at first disposed to accept as a valuable discovery, until it gradually became revealed, that it was by no means as safe and innocent as it appeared. A reaction of a very unfavourable character set in against it; its first active advocates almost, and in some instances entirely, abandoned its use; changes were rung upon its shape and material; and now we learn by the discussion reported in the volume before us, what estimate is placed upon it by our leading gynæcologists, some of whom have had an extensive experience with its use. We will give a very condensed *résumé* of the views expressed.

Dr. Chadwick, of Boston, recommended an elastic ring pessary, with a slender hard-rubber flexible stem attached, having an olive-shaped bulb at the free end, and the other fixed in a button-shaped shield. He had used this instrument in a number of cases; in two, of chronic metritis and peritonitis, metrorrhagia had been induced, in no other instance were there unpleasant symptoms.

Dr. Peaslee, of New York, was in general decidedly opposed to the stem pessary, except in certain forms and degrees of flexion; did not employ it in any case of retroflexion, would use it in some extreme cases of antelexion, preferred in general an elastic intravaginal pessary.

Dr. T. G. Thomas, of New York, was opposed to anything like a general use of the stem pessary, on account of the damage attending it in some cases; was a pupil of Valleix, and at one time an advocate of the instrument, but had changed his views by time and experience, having met with several cases of induced cellulitis and peritonitis; he felt that its sphere should be limited, and the danger of its use properly recognized. He believed that the vaginal pessary was competent to relieve most of the cases of flexure, and recommended several forms which he presented.

Dr. Noeggerath, of New York, advocated the use of the stem pessary. Had employed it in dysmenorrhœa and sterility coincident with antelexion, and exceptionally in retroflexion; used a lead stem two and an eighth inches long, with Conant's hard-rubber rings; had used it in more than a hundred cases, with three serious consequences, viz.: 1, hæmatocele at beginning of menstruation; 2, acute mania from pain immediately after removal, in a lady previously affected in the same way by excessive menstrual pain; and 3, pelvic peritonitis and death, the inflammation beginning immediately after the removal of the instrument. Dr. Noeggerath usually inserts the stem, under anæsthesia, at the house of the patient.

Dr. Goodell, of Philadelphia, had changed his views by experience in favour of the instrument, although at one time opposed to it, in consequence of trouble set up in two cases. Used the glass, or smooth rubber stem, or the split one with the arms having a weak spring; took care that the same should not reach the fundus by half an inch. Never introduced the instrument in his office; before the first introduction, secured the button with a strong traction-thread, for the patient to use in removing the instrument, if pain should go on from bad to worse; cut away the string as soon as the uterus became tolerant; had had no bad result under these precautions, but always felt apprehensive of coming evil whilst using the instrument, and relieved at its final removal. Dr. G. had a case of dysmenorrhœa with antelexion, in which impregnation took place with the split stem *in situ*; the instrument was withdrawn, and the pregnancy advanced. He gave preference to the Hodge closed lever pessary, introduced wrong end first, for the vaginal support in cases of antelexion.

Dr. A. H. Smith, of Philadelphia, also gave preference to the Hodge pessary, as modified by himself; could not endorse the enthusiastic praise given in the paper

of Dr. Van de Warker; had seen excellent results from the intra-uterine stem in retroflexion, of the retort form, leaving the instrument *in situ* temporarily, until the tissues at the point of flexion should become so modified as to remain unbent after the stem is removed.

Dr. W. L. Atlee, of Philadelphia, believed all forms of pessaries to be injurious; he thought that simple change of position in the uterus would occasion no marked inconvenience, unless the organ or pelvis were unhealthy, and if so, then he directed his treatment to restore the part affected to a normal condition.

Dr. Wilson, of Baltimore, endorsed the views of Dr. Atlee. Had never seen a pessary benefit an anteversion; had used stem pessaries twelve years ago in their various forms, but had abandoned them entirely; had employed the Hodge pessary in anteversion after the manner recommended by Goodell, but invariably without success.

Dr. Byford, of Chicago, believed that flexions were due to pathological conditions, and that to effect a cure, not only should the primary condition but its result be overcome. "If the pathological condition is not corrected, a straightening of the flexion is of no use." He recommended the use of tents of slippery elm bark, with a thread attached, to remain from three to twelve hours, and be removed by the patient if pain is produced: one, three, or five tents may be required. Dr. Byford dilates the cervix by these tents, using as many as a dozen in the course of half an hour; he also treats dysmenorrhœa by the use of a tent four or five times in a month, the last, two days before the period; he never uses the intra-uterine stem.

Dr. Skene, of Brooklyn, thought that the abandonment of the stem pessary by its early advocates was a strong argument against it; he had seen bad results from its careful use, and stated that after being long worn the flexion remained, or returned after its withdrawal.

Dr. Garrigues, of Brooklyn, remarked that Olshausen, of Halle, had seven patients with cellulitis, out of eighty-eight treated by the stem; he spoke of Squarey's flexible rubber stem pessary as the most likely to be tolerated by the uterus in cases of dysmenorrhœa.

Dr. WILLIAM GOODELL, of Philadelphia, reported the following *Case of Vaginal Ovariectomy*:—

Woman 22, single. health failing for two years: uterus behind symphysis; tumour in Douglas's pouch; sound measurement four inches; admitted into Hospital of University of Pennsylvania; aspirator used Feb. 21, 1877, and a large tumbler and a half of fluid drawn out, which, under examination, was pronounced ovarian. Patient much relieved from pressure inconveniences for a time; but cyst filled again, and was retapped by aspiration on March 3d, the fluid being turbid, somewhat sanious, having a slight odour of sulphuretted hydrogen, and measuring nearly a quart. Symptoms of blood poisoning appeared, fever, loss of appetite, hectic flushes, sweating, and finally incessant vomiting; pulse 120: temperature 102.5°. Woman alarmed, and consented to operation of removal, which was performed on March 14th. Several ounces of fetid pus escaped on opening Douglas's pouch; numerous adhesions found; fluid from cyst drawn off, amounting to two quarts, a dirty, grumous pus, with highly offensive gas; a second cyst contained about an ounce of clear syrupy fluid. Cyst without pedicle; transfixed at base, and tied around each half, then cut away. Several smaller cysts found, with contents unchanged, and some calcareous plates. No peritonitis resulted; septic symptoms gradually subsided, and woman recovered.

This case shows the danger of aspiration, and the importance of extirpation following it as soon as possible. The delay was here unavoidable, as the patient only gave consent when in fear of death.

Dr. Goodell reports seven operations, all American, and all ending in recovery. He advocates the removal of post-uterine cysts, while small and non-adherent.

A chief advantage in some cases is that of drainage, the discharge being very abundant.

Dr. Chadwick was of the opinion that where the discharge was serous, it ought to be retained, to keep the intestines separated, and prevent adhesions.

Dr. Noeggerath treated even large cysts by incision, and stitching the vaginal to the cyst wound, so as to drain out the tumour. Small cysts he punctured, and emptied with a fine cutting canula, and had thus treated about ten, the largest containing some three ounces of fluid. He had twice ruptured thin cysts by pressure exerted by one hand over the abdomen, and the other in the vagina.

Is there a Proper Field for Battey's Operation? is the title of a paper by Dr. ROBERT BATTEY, of Rome, Georgia. We have entered upon this question on a former occasion, which is one about which there will necessarily be much difference of opinion. It is generally conceded that Dr. Battey is perfectly honest in his convictions, and humane in dealing with his cases, upon which he operates with the best intentions; but there is great danger of unnecessarily unsexing the patient, and also failing in the desired result, even if she escape death. There is certainly a field for the operation, and great relief may be afforded by it; but the field is very limited, and we should be sure that there is no other possible remedy. There are existences that are worse than death; the life being rendered intolerable by reason of pain and exhaustion, due to the functional activity of the ovaries. We have seen women that would have been much better without their ovaries; but whose condition, notwithstanding, would not have justified their removal; and we have known others, in whom the operation could not have been reasonably objected to. Such cases as that reported by Dr. Goodell, in this Journal for July last, page 36, are certainly proper subjects for this operation. Knowing well the continued and excessive suffering of this lady before the operation, we can appreciate her feeling of gratitude at the wonderful result of its performance.

Dr. THEOPHILUS PARVIN, of Indianapolis, Indiana, reports a *Case of Ovariectomy followed by Fatal Tetanus*, which, in our climate, is a very rare sequence of ovariectomy. Dr. Parvin's patient became affected on the fifth day, and died on the sixth. He gives a table of thirteen operations ending in tetanus, with but one recovery.

The value of Electrolysis in the Treatment of Ovarian Tumours is discussed by Dr. PAUL F. MUNDÉ, of New York. There is a disposition at the present day to decry the use of the knife; not because there is a better plan to be substituted for it, but for the reason that the great mass of the community has a mortal fear of an incision, and will endure almost anything rather than have a morbid mass cut out; hence a cure without cutting becomes a popular road to fortune; and claims, far beyond the real merit of the method adopted, are by a species of charlatanic urging, made to deceive the suffering and sometimes even the profession.

The question of the proper treatment of ovarian tumours is too important to allow any method which offers hope of better results than is now obtained by ovariectomy to pass without careful and impartial examination of its alleged advantages and disadvantages, and the determination of its exact value. This Dr. Mundé has undertaken to do for the electrolytic method, and he has given the whole question a most thorough sifting, and his deductions are only the natural results of the cases presented. Had Dr. Semeleder remained in Mexico, instead of going to New York in 1875, his claims to success in electrolysis might have been difficult to overthrow; but the results of the cases treated by him, and of those treated by others, according to his directions, during his visit to that city, were

not successful, but did much to establish the value of the process as a means of cure.

The investigations of Ultzmann, of Vienna, have settled several questions of interest. 1. The cysts most amenable to electrolytic treatment are those which contain a watery sero-albuminous fluid; 2. Cysts filled with thick, viscid, honey-like fluid are scarcely diminished by the strongest currents; 3. Electrolysis is positively injurious where the fluid contents are composed of decomposed blood or pus, producing at once symptoms of peritonitis; 4. The galvano-puncture *does* cause adhesions of the cyst with the omentum, or abdominal wall; 5. The cystic fluid changes under electrolysis, and pus corpuscles may be developed, to disappear in time; 6. Cases apparently cured, will return in time with tumours as large as ever. 7. Electrolysis with failure, complicates the case for the operation by the knife.

Dr. Mundé reports 51 cases, resulting as follows, viz., cured, 25; permanently improved, 3; temporarily, 4; no benefit, 6; peritonitis, with recovery, 4; peritonitis, with death, 9. Compare with this the ovariectomy report of the Samaritan Hospital for 1876, and we find 50 cures and 5 deaths, under Spencer Wells.

The author sums up his conclusions as follows: "Judging partly from these statistics, and partly from general considerations, it would seem that electrolysis can in no wise supplant ovariectomy, and that the cases in which it would appear justifiable to subject the patients to the tedious and protracted course of galvano-puncture usually indispensable to the attainment of any results, good or evil, narrow themselves down to two classes: 1. Small monocysts, in which the discomforts are so slight as to render the more serious radical operation as yet uncalled for, and in which it seems fair to give the patient a probable chance of a cure by milder means; and 2. Particularly large unilocular, or multilocular tumours, in which the presence of extensive adhesions, especially in the pelvis, renders ovariectomy impracticable, and in which a palliative procedure is desirable and admissible, so long as it affords the patient a hope of relief, and temporary prolongation of life. (Page 435.)

"There is one method of electrical treatment which at least is almost innocuous, and may therefore be employed if the condition of the patient permits the delay. This is external galvanization or faradization, by both of which methods cures of ovarian tumours are reported by reliable authorities."

When we consider that even a complete cure by the galvanic current cannot be relied upon for permanence, because the ovary is still *in situ* to take on disease at any time, we recognize how little real value there is in any method of treatment as compared with the ablation of the diseased organ. If patients were candidly informed as to this point, there would be fewer anxious to avoid the knife.

Congenital Absence, and Accidental Atresia of the Vagina; mode of Operating to establish the Canal and Evacuate retained Menstrual Blood, is the title of a contribution by Dr. THOMAS ADDIS EMMET, of New York. It is well known that this class of cases, particularly where there is an accumulation of menstrual fluid, has been for a long time regarded as in many instances dangerous to relieve by evacuation; even the opening of an imperforate hymen, whether by large or small incision, having resulted in death. Various theories have been advanced to account for this result, but Dr. Emmet's cases and treatment, when measured by his success, would appear to solve the question of danger. Simple evacuation by incision will not answer, as the parts remain coated with a tarry deposit, which by the admission of air becomes decomposed, and inflammatory changes or septic infection are set up. All the blood must therefore be removed and the uterus and vagina made clean, which Dr. Emmet accomplishes by syringing with warm water until the same comes away colourless.

Twenty-two cases are given in this report as the experience of the author, all of which recovered, viz., Imperforate hymen, with retention from one to two and a half years, 4; congenital absence of the vagina, 7; accidental atresia from childbirth, 9; the same from injury, 1; the same from amputation of cervix with galvano-cautery, 1.

Results of Operating.—Imperforate hymen cases, no after-difficulty. 3 cases of restored vagina with retention resulted in cellulitis in 1. 1 case where no uterus could be found at the time of operation, subsequently menstruated. In 3 women there was apparently no uterus. 1 case of early traumatic atresia developed rapidly to womanhood after restoring the vagina. In the 9 women with atresia following childbirth, all had retained menses, and but one suffered an attack of cellulitis after evacuation and irrigation. The atresia from amputation was relieved from time to time, but there was no hope of entire cure.

Dr. Emmet remarks upon amputation of the cervix as follows: "When the crown of the cervix is removed above the vaginal junction" by the galvano-cautery, "stenosis is a very frequent occurrence within two years after the operation. Where the surface is left to heal by granulation, cicatricial tissue must necessarily be formed, and it cannot be denied that this tissue always contracts, therefore stenosis must be a common result. But whenever the vaginal tissue is included, we have a more serious condition to deal with. In healing, it contracts over the stump, as if drawn with a running-string, so that the uterus becomes at length covered by two thicknesses of the vaginal wall." (Page 468.)

Dr. E. claims to have originated the plan of completing the operation of vaginal restoration or formation at one sitting; of freely separating the tissues by passing the finger from one side to the other in the pelvis; to have given free exit to the retained menses; and to have washed out the uterus with warm water to prevent blood-poisoning.

Dr. GEORGE J. ENGELMANN, of St. Louis, Mo., discusses *The Hystero-Neuroses, with special reference to the Menstrual Hystero-Neurosis of the Stomach*. It is well known to the profession in general that the uterus is the *fons et origo mali* in many of the nervous, painful, and mental affections of women. This highly sensitive organ appearing in many unaccountable ways, even when scarcely at all diseased, to act as a centre of reflex disturbance upon almost every part of the economy. How or why this is done we are left only to conjecture. We see the multitudinous effects, and trace them often by an accident to their proper origin; we treat a discovered abnormality, so slight it may be, that but for the teaching of experience we should be inclined to ignore it altogether, and the patient recovers; and we find again the same organ seriously deranged, without any sympathetic disturbance whatever. The author defines the meaning of the title to his paper as follows:—

"By this term hystero-neuroses, I would designate those phenomena which simulate a morbid condition of an organ, unaccompanied by any structural changes in that organ, and which are the result of a reflex action, a sympathetic hyperæsthesia, due to uterine derangements, and demonstrated to be unquestionably so dependent by being intractable to direct local medication, but yielding at once upon treatment of the casual pelvic disorder."

"They are entirely distinct from the transitory and variable symptoms of hysteria which I am inclined to place among the cerebro-spinal affections, and which are but very indirectly influenced by the condition of the uterus or its annexa. Moreover, the hystero-neuroses are generally found in women who can by no means be called hysterical in the sense in which this word is necessarily used." (Page 483.)

"In their early stages purely nervous, they are at once and permanently removed by relieving the disease of the uterus. Should this, however, continue, structural changes will gradually develop in the organs, which are the seat of

the hystero-neurosis, so that in the end we shall actually find the disease, which was at first only simulated, by irritation of a certain set of nerves."

"These hystero-neuroses may be more or less continuous, due to chronic uterine disease, or only appearing at certain times during exacerbation of such disease; they may also be brought about by the physiological changes of menstruation, or of pregnancy in an irritable or diseased womb, and we may hence classify them in accordance with their causative connection, as constant or pathological hystero-neuroses, menstrual hystero-neuroses, and hystero-neuroses of pregnancy." (Page 484.)

The author for the purposes of illustration divides his subject into the following heads:—

"Hystero-neuroses of the brain." "Gynæcologists have paid but little attention to this subject, and the text-books give us either very unsatisfactory information, or do not even refer to the fact that a relation may exist between diseases of the womb and mental aberration. We owe our entire knowledge of these conditions to the close and careful observation of Louis Mayer, of Berlin, and Fordyce Barker, of New York." (Page 486.)

Six cases are given in illustration; one or two will suffice to show the conditions involved. The first could hardly be classed as reflex.

CASE I.—Mrs. V.; 40; melancholia; increase at each menstrual period; no abnormality of sexual organs as to size, character, or position; and flow regular and without pain.

Shroeter observed the cases of 212 insane women, and found that the larger proportion had menstrual irregularity; but in no one was a regulation of the function attended with a restoration to reason.

It is very difficult to establish the exact utero-mental connections of insanity, as they may be direct or indirect and retroactive. We have seen repeated attacks of alienation due to menstrual excess, the result of a residence in a hot climate, cured by removal to a much colder region. Hemorrhage was no doubt only partly the cause, as the hyperæmia of the uterus must have been an active reflex factor in the case.

CASE II.—Girl, 17; well developed and robust; daily epileptic; menstruation irregular and scanty; antelexion; erosions; endo-cervicitis. Nitric acid to cervix; no fit for five days; then gradually returned at shorter intervals. Bilateral incision of cervix with dilatation; menses became regular; slippery elm tents used, and occasional applications to the lining of cervix. Epilepsy ceased, and healthy mental condition restored.

CASE III.—Girl, 18; amenorrhœa, erosions, endo-cervicitis; pale, undeveloped, almost idiotic, complete hemiplegia. Mind defective; sometimes remained in bed in an unconscious state for weeks. A monthly exacerbation marked, with headache, backache, and often vomiting. Vaginitis and vaginismus found on examination. Treatment established the menstrual flow, cured the vaginal and uterine affections, caused the girl to become well developed, and removed her mental and physical disabilities, except the paralysis, which was improving under electricity.

"Hystero-neuroses of the eye." These are confined to those cases in which defective vision is directly the result of uterine abnormality, and not due to any structural change which the ophthalmoscope can detect. Cases of amaurosis during pregnancy and lactation; and of extravasation of blood in the retina during cerebral and pulmonary congestion resulting from amenorrhœa and dysmenorrhœa, are not of this class. Blindness may appear in a few hours without cerebral congestion, and disappear as rapidly.

Dr. Engelmann also describes hystero-neuroses of the pharynx, larynx; bronchi, with obstinate cough relieved only by treatment addressed to the uterus, after all other means have failed; of the breasts, intestines, joints, and stomach.

The last are much the most common, and may be directly pathological, or the result of menstruation or pregnancy.

Uterine disease is a very common cause of indigestion, nausea, and vomiting, which are relieved or cured by treating the primary lesion. Stenosis of the cervix may act as an exciting cause in producing obstinate vomiting and repeated convulsive attacks which will only yield to incision and dilatation. We have seen very obstinate vomiting result from the use of a sponge-tent within a few days. "Menstrual hystero-neuroses of the stomach" are not at all uncommon, particularly in the form of swelling, with either pain, nausea, or vomiting. Dr. Engelmann estimates that from one-fourth to a third of the inmates in a general hospital for women are thus affected.

Papers presented to the Council by the Candidates elected to Fellowship in 1877.—Dr. GILMAN KIMBALL, of Lowell, Mass., presented some cases illustrating important points connected with ovariectomy.

CASE I.—Shows the advantage of drainage through the Douglas pouch and vagina; and benefit of an early change to solid diet.

CASE II.—Bleeding from abraded peritoneum controlled by torsion of the larger vessels, and by hand pressure for half an hour or more, with thick compresses of cotton cloth. Wound was closed with quilled sutures, "the lips of the incision being first everted to such an extent as effectually to exclude nearly all that portion of the inner surface of the parietes to which the tumour had been attached." The whole cyst and contents weighed 100 pounds. On the 10th day she took solid food; sat up on 20th; almost healed on 23d.

CASE III.—Peritonitis already commenced at time of incision, extensive parietal adhesions, abraded parts everted, not less than ninety square inches shut off from the peritoneal cavity, torn surfaces secured by cylindrical clamps an inch and a half long, and third of an inch in diameter, canula inserted in Douglas's fossa for drainage, much putrid matter thus escaped, and septic poisoning avoided.

CASE IV.—A considerable portion of omentum ligatured and cut away to arrest hemorrhage due to adhesions broken up between it and front of tumour, drainage established through vagina, with good effect.

CASE V.—Cyst ruptured from a fall; woman emaciated and bedridden; abdomen 60 inches in circumference; patient 70 years old; thirty pounds of fluid in abdomen from ruptured cyst; extensive adhesions; lacerated parts tied with silk cut short; vaginal and abdominal tubular drainage established; wound closed by five clamp or quilled sutures two inches apart. The damaged peritoneal surface thus excluded from the abdominal cavity was not less than seven inches in width, and ten in length. Slow, but good recovery; tumour 81 pounds. The abdominal tube found very effective for drainage, and antiseptic washing.

The Radical Treatment of Dysmenorrhœa and Sterility by rapid Dilatation of the Canal of the Neck of the Uterus.—In this paper Dr. ELLWOOD WILSON, of Philadelphia, says, that for the past five years he has abandoned incisions and the use of tents, and resorted exclusively to rapid dilatation in the management of painful menstruation, whether the contraction be due to congenital formation, catarrhal or other inflammation, or flexions. For this purpose he has devised a curved instrument in three sizes, opening by pressing the handles together, either by the hands, or aided by screw power, the tips of the three representing the sizes 5, 8, and 11 of the English catheter.

In using the dilator, etherization is employed in sensitive cases, but may be dispensed with in many subjects; and the operation is performed through a speculum; Nott's self-retaining being preferred. "Should the resistance be marked, the blades are only partially expanded and slightly withdrawn, when they are again closed and carried a little further on, and expanded, and this is repeated until the internal os is passed," the smallest sized dilator being first used, and if requisite, the second and largest in order. "Performed in this manner, dilatation of the neck of the uterus has never in my hands been followed by any un-

toward symptoms. It is of course painful, but rarely for more than a few minutes. If carefully conducted, the hemorrhage and discomfort are so very trifling that I not unfrequently resort to it in my office, the patient walking or riding home after a short rest. She should keep quiet for forty-eight hours, but beyond this precaution, no after-treatment is necessary."

Appended to the paper of Dr. Wilson, are the reports of eleven cases in which the instrument was used. We give the points of interest:—

CASE I.—Married 13 years; barren; menstruation painful and scanty; had had her cervix frequently dilated by tents and bougies, with temporary amelioration. Dilator used to full extent in January, 1873, and again in February, just before menstrual attack; menses free and voided without pain; March period, did not confine her to bed, the first time in years; delivered of a living child in December, 1873.

CASE II.—Married 11 years; very similar; also became a mother.

CASES III., IV., V., all became pregnant; Case IV. having had three children since the dilatation, which was done on three occasions.

CASE VI.—Married 2 years; uterus very small and irregularly developed; sound measurement only 23 lines. Dilator used at intervals of 7 to 14 days for eleven months, by which time the sound passed $2\frac{1}{2}$ inches, and menstruation was regular, free, painless, and lasted five days; became pregnant, but aborted at three months from exertion and over-fatigue.

Four of the remaining cases were single, and all cured of painful menstruation after the same treatment.

Vascular Tumours of the Female Urethra is the title of a paper by Dr. A. REEVES JACKSON, of Chicago, Ill. These are more frequent than is usually supposed, and should be suspected to exist if there is pain in urination, a frequent desire to urinate, and bleeding at the close of the act. In bad cases, there may be sudden stoppage of the flow, with spasm of the bladder, and excruciating pain; a mucous discharge; heat and throbbing in the vulva, with constitutional disturbances in the form of loss of appetite, headache, wakefulness, etc.

The urethra should be explored under ether, the growth cut away, and nitric acid applied. If the growth is flat, and non-pedicellated, the acid will suffice. Dr. Jackson has devised a fenestrated glass speculum, half an inch in diameter, with which to examine and make the applications in these cases. In using nitric acid, he takes a little dampened cotton, dips it in fuming acid, and applies it firmly against the spot from which the growth has been cut away; or upon the flat patch of disease, for at least a minute. Bleeding can be arrested by simply rotating the speculum so as to apply the closed portion over the exuding surface.

The Simpler Varieties of Perineal Laceration.—Dr. THADDEUS A. REAMY, of Cincinnati, Ohio, had examined 600 cases of rupture of the milder types in twelve years; 421 superficial of fourchette and perineum; and 179 rupture of sphincter ani. He draws the following conclusions from these cases, viz.:—

A. "Perineal lacerations, to a degree of importance in ultimate results at least, are far more common than is generally recognized by physicians and patients."

B. "No form of laceration, however simple in degree, heals with union by first intention when unaided by surgical closure."

C. "When a laceration in any degree heals by granulation, it necessarily leaves cicatricial, and other deformities."

D. "Slight perineal lacerations play a more important role in the induction of bodily and mental disease than is generally recognized."

E. "Since a perfect cure in any case can only be effected by surgical closure of the torn edges, *immediate* or *remote*, the same rules should apply to the management of simple cases, as to severe ones."

F. "It would follow that simple cases ought generally to be operated on at the time of the accident, since this is accepted as proper for severe cases."

G. "Cases of perineal laceration in the first and second degree, which are not closed by suture primarily, should be operated upon so soon as any of the symptoms, physical or mental, traceable to the deformity arise."

In not one of the 600 cases, all healed, was the union by the first intention.

The Menstrual Cycle is the title of a paper by Dr. JOHN GOODMAN, of Louisville, Kentucky. The period of time that elapses between the successive appearances of the menses in a woman who claims to be *perfectly* regular, is usually set down as twenty-eight days. Dr. Goodman made a series of observations in the cases of 41 women, to whom he gave blanks to fill up; the calculations being made from the centre of one epoch to the next. In several claiming perfect regularity, he found considerable variation. The nearest to absolute regularity ran 28, 26, 26, 28, 28, 28 days; but a fair example of the whole gives 29, 23, 25, 29, 32, 26 days, as the consecutive intervals. The general mean was $27\frac{1}{2}$ days, the exact average of the second example we have quoted. A low but regular average is given in Case IV.: 23, 23, 23, 20, 22, 23, 23; mean $22\frac{3}{4}$; a series of long intervals, in Case XXVII.: 31, 32, 40, 34, 41, 33, 31; mean $34\frac{1}{4}$.

"The length of the cycles does not bear any fixed relation to the age of the individual."

R. P. H.

ART. XXI.—*The Liverpool and Manchester Medical and Surgical Reports*. 1877. Edited by JOHN WALLACE, M.D. 8vo. pp. xvi. 244. Liverpool: Adam Holden, 1878.

THE volume before us might have been considerably reduced in size with advantage to the reputation of its editor and contributors. Badly bound, containing fourteen articles, some of them of indifferent merit and all disfigured by typographical errors, it hardly forms an issue which will bring any great credit to the parties concerned in its publication. It opens with a long, rambling, loosely written article by HUGH OWEN THOMAS on *The Past and Present Treatment of Intestinal Obstruction*, which hardly presents a single redeeming feature for its 58 pages of existence. The *drift* of his paper is expressed in his tenth conclusion, when he states "That there are only two indispensable remedies required for the treatment of these difficulties [*i. e.*, intestinal obstructions from *whatever* source, with the sole exception of a loaded rectum], opium and gastro-enterotomy. The former is indicated in every case, while the latter is required when symptoms show that the former must fail." The *character* of his essay is expressed in a statement made on page 41, where he refers to "the prevailing fashion in nearly all diseases to urge the use of what are misnamed stimulants, as brandy, wine, ammonia, etc.: the belief in their stimulating properties being based upon no better premises than the fact of the one being pungent to drink, and the other volatile and an irritant to the nostril."

The next article is an extremely interesting and well-written paper by JAMES ROSS, M.D., M.R.C.P., entitled *Bacteria not essential to Infection*. Accepting as the first proposition in his argument the fact that the bacteria of infective fluids are stated to belong to the first group of Cohn's classification, the sphæro-bacteria or micrococci of Hallier, and that as stated by Wagner it is almost impossible to distinguish these bacteria from certain granules and molecules which are found in the higher organisms during health, the author's object is to prove that the so-called bacteria which have so often been claimed to exist in infective fluids are not bacteria at all, but free granules and specks of protoplasm derived from the disintegration of the tissues of the body. In support of this view he states that in

the central contents of an abscess produced by injecting three minims of strong ammonia into a frog's thigh, he found only a few altered red blood corpuscles with scarcely any full sized white cells, the corpuscles present being with varying intermediate signs, from the $\pi\sigma\sigma\sigma$ to the $\pi\sigma\sigma\sigma$ of an inch in diameter. These very minute particles, which he maintains have often been mistaken for bacteria, were very numerous and active, and when acetic acid was added resisted its action as long as the granules of the larger corpuscles, and that when the protoplasm was dissolved from these cells, the resulting granules could not be distinguished from the free particles. As further support of the view as to their identity he mentions that the fluid taken from the margins of the abscess contained no red cells, a greater number of full-sized white cells, and fewer free granules, the variation being interpreted on the supposition that the inflammation had been much less intense, at the margins of the abscess, and that consequently there had been less disintegration. The author further states that the morphological elements of a pyæmic abscess are of the same character, and suggests the same explanation as to their formation; corpuscles less in size than in healthy pus and more granular, and a large number of free particles in active motion—Brownian in character—which could only be distinguished from bacteria (sphæro-bacteria) by the application of chemical tests, proofs which he claims have not been furnished by the discoverers of so-called bacteria in infective fluid. In addition to the fact that these particles cannot be distinguished from the granules imbedded in the white corpuscles, instead of finding an accumulation of bacteria in the capillaries of the body, as one would expect under the germ theory were these particles really independent organisms, the appearances found are very different, more nearly resembling those of tuberculosis in the mesentery of the lower animals, viz., an accumulation of a large number of white corpuscles surrounding the vessels. Dr. Ross applies the same explanation as to the nature of the particles found in the desquamation of scarlet fever, the so-called vaccine organisms and the particles of smallpox, where, although numerous free granules and even clusters of active granules are found, no undoubted rod-bacteria have ever been detected when their presence could not be explained as having been introduced from external germs.

As regards the organisms which Dr. Klein claims to have discovered in the lymphatics in smallpox, Dr. Ross shows that they were appearances entirely produced through his method of manipulation, and were not organisms at all, since he has frequently seen precisely the same appearances in the intestine of a rabbit poisoned with a vanadium salt. Added to the arguments drawn from the morphology of these particles as to the probability of their originating from the disintegration of the tissues of the body, the author shows that other reasons may be drawn from a consideration of their function. While not denying that the admission of these bacteria into wounds, etc., increases the danger of pyæmic infection, and therefore he admits the value of antiseptic treatment, he claims, however, that this new element of danger is not due to the creation of a parasitic disease, but simply to the occurrence of septic changes in the contents of the abscess, precisely as would occur in any other putrescible fluid outside of the body; while the increased infective power is due to the increased inflammation and disintegration of tissue—the results of that disintegration being themselves the source of the infection; so placing the theory of pyæmic infection in analogy with the infection of tuberculosis, cancer, and other pathological tissues.

As proof as to the necessity for the existence of some other element over and above that of bacteria in order to constitute an infected atmosphere, he alludes to the fact that an albuminous fluid will putrefy and contain bacteria nearly as soon in pure country air as in the infected ward of a hospital, while there is no

such comparison between the results of surgical cases under the two circumstances.

The author's position is further strengthened by the fact that, after death from erysipelas and peritonitis, when the danger of infection is at its height, the blood is crowded with these granules, the so-called micrococci, while no true bacteria exist, while after putrefaction sets in, and true organisms appear in myriads, the infective power, so far from increasing, soon disappears altogether.

The foregoing abstract represents the views advanced by Dr. Ross before the meeting of the British Medical Association at Sheffield in 1876. We have presented them somewhat at length on account of their importance, and because we have, as yet, seen no attempt at their refutation. It is true, as Dr. Ross states in the supplement to his paper, that the statement of his views has been met with the *assertion* of contrary views by "competent observers;" but this, so far from weakening his position, may be regarded as one of its strongest supports, since, if *assertions of opinion* are the strongest arguments to be advanced by "competent observers," it is to be presumed that incompetent observers can advance no stronger arguments.

That infection may be due to the disintegration of the white corpuscles appears to be confirmed by the experiments recently made by Dr. Köhler, of Dorpat, under the direction of Prof. Schmidt. He found that symptoms analogous to those of septicæmia were caused by the injection of the strained fluid from a broken-up clot (the formation of which Dr. Schmidt has shown to be due to the results of the disintegration of the white cells) into the arterial system of an animal, which blood had been drawn only twenty minutes before from the arteries of the same animal; it is true that Dr. Köhler states that bacteria were also present, though he gives no explanation as to their source, and was probably misled by the appearances alluded to by Dr. Ross. Dr. Sanderson has also made use of these experiments in support of his own views, but apparently on entirely insufficient grounds. In the supplement to his paper, Dr. Ross states that he has watched the gradual dissolution of the protoplasm of a pus-corpuscle, and the apparent metamorphosis of the granules into bacteria, an observation analogous to that of Dr. Clark, of Boston, who noticed the apparent formation of vibrios from the fibrillæ of muscles, though he explains it on other grounds than as an instance of heterogenesis. The paper is illustrated with a plate.

The next fifteen pages of the report are occupied with an account of *Some Results of Lead Impregnation*, by Dr. SHEARER, of Liverpool, consisting of notes of six cases, which, however, present no very unusual features.

We come next to an article on *Turning*, with *Notes of Forty Cases, with Remarks*, by T. H. V. GROSHOLTZ, L.K. and Q.C.P., etc. Of the 40 cases in which the author performed version, 32, or four-fifths, were for malpresentation of the fœtus, of which the shoulder presented 17 times; arm and funis, 7; arm, 3; face and hand, 3; brow, 1; back, 1. Of the remaining eight, 3 cases were on account of pelvic contraction, 3 for placenta prævia, and 2 for uterine inertia. No note is made as to their numerical relation to normal labours. As to the results, he states that no maternal deaths occurred, and that eighteen children were either born dead or died soon after birth. Of these 18, 7 are stated to have been dead some time, as shown by signs of putrefaction; omitting these, the mortality is 1 in 3. Of the remaining 11 born dead, in 2 cases there was prolapse of the funis, 1 placenta prævia, "and the remaining 8 might be roughly classed together as owing their death to a disproportion between the maternal pelvis and the infantile cranium."

The next paper is by Mr. J. DIXON MANN, on *Chronic Atrophic Rhinitis*. After describing the prominent features of the disease, he publishes the notes of

our cases, of which one was the sequence of traumatic rhinitis; two were of syphilitic origin, and one followed simple nasal catarrh; in all of these the application of a dilute ointment of the red oxide of mercury was followed by beneficial results. He recommends the application of the ointment on a brush, mounted on a curved wire handle, for the posterior nares and vault of pharynx. When the seat of the disease is more anterior, the bulb of a small olivary bougie may be coated with ointment, and carried up to the seat of mischief, avoiding touching the walls of the passage until the desired locality is reached. This treatment should be employed every day when practicable, or at least three times a week, several applications being made at each sitting; it is claimed to succeed in cases which have resisted astringent and stimulating douches, atomized fluids, and insufflated powders of various kinds, and general treatment. In the syphilitic cases general specific treatment was also employed.

As *Gleanings from Obstetric Cases*, Mr. J. ARMSTRONG reports a case of vaginal hæmatocœle, occurring after the second stage of labour, and a case of puerperal septicæmia. As a conclusion from the sparse clinical notes of the latter, the author states "that this was a case of puerperal septicæmia, probably due to self-infection, its origin being a foreign body retained in the uterus, which decomposed, and was absorbed. The foreign body may be a bit of placenta, or membrane, or retained coagula. *I had no reason to think it could be any of these.*" He also concludes, from the same facts, that in similar cases, the obstetrician would be justified in attending other labour cases, provided he kept his hands clean; and that such case might be attended in a lying-in hospital with impunity to the other patients, provided she had a separate nurse. He also reports a case of puerperal eclampsia, occurring at the seventh month of gestation, in which chloroform was used successfully.

Under the heading of *Cases from Surgical Practice*, Mr. ANDREW BONTFLOWER has contributed notes of two successful cases of ovariectomy, and a description of a new method of operation for nævus. As Mr. Bontflower thinks that one difficulty with the ordinary clamp in cases of ovariectomy is, that the pedicle is not compressed uniformly, he has designed one which he thinks will remedy this defect, and represents it in a drawing. He has never, as yet, used it. His method of operating for nævus he describes as follows:—

"I passed three acupuncture pins horizontally, at equal distances, and parallel to each other. After puncturing the skin with the point of the pin, I passed it on in a rotatory kind of way, something like darning a stocking, backwards and forwards, taking care to keep the point away from the skin and mucous membrane until it emerged at the opposite side of the lip; endeavouring in this way to secure compression of all the veins, and at the same time to include them all in the grasp of the pin. This, I believe, would have been sufficient, but in order to make quite certain, I passed a ligature of worsted, in a figure-of-8 fashion, over the pin, but not sufficiently tight to impede the circulation in the skin. The worsted was allowed to remain three or four days, but the pins were not removed for a fortnight; the parts gradually shrunk, the veins became obliterated, the darkened, purplish skin resumed its healthy hue without any cicatricial marks; and in about eight weeks the lip had so far resumed its natural size and shape that it would have been difficult to trace any sign of the nævus."

He presents the likeness of another case operated upon in the same manner, in which, judging from the appearance "before and after," the success was equally as good.

Mr. RICHARD CATON has made a case of *Plastic Bronchitis* occurring in a boy five years of age the basis of a communication as to the Pathology of this disease. The author states that "owing to its comparative rarity, no very careful investigation has yet been undertaken of its pathology. The last impor-

tant paper which has appeared on the subject in the English journals, is one published by Dr. Peacock in the *Pathological Transactions* in 1854." If we accept this statement as true previous to the writing of Dr. Caton's article, we are warranted in considering its truth more decidedly established now. The paper is illustrated by a lithograph.

Mr. FRANCIS VACHER has published a "*Note on an Improvement in the short hinged Forceps*," as an addition to his other improvements detailed in the volume of these Reports for 1874.

As illustrations of the "*Value of Venesection*," Mr. T. R. GLYNN has reported several cases of bronchitis and heart disease and one case of renal disease with uræmia in which blood-letting appears to have been of some service. Among the "*Remarks*" it appears that "it would be quite possible to diagnose cases of bad bronchitis and emphysema by the *nose alone*, from the fumes of brandy and ether which generally surround them."

Following the above communication is a long and well written article by Dr. E. H. DICKINSON on "*The Phenomena of so-called Direct Paralysis*." Instead of taking the ground, as has lately been done elsewhere in England, that because these cases do not accord with preconceived notions, therefore the data of observations themselves are false, Dr. D. reports with great elaboration of detail and after the careful consideration and refutation of every argument which could be urged against its acceptance as such, a case which would establish conclusively, if such confirmation were needed, the *existence* at least of a class of cases in which the paralysis occurs in and is confined to the side of the body corresponding to the lesion in the brain. After alluding to the various more or less weak hypotheses which have been proposed by Bennett, Copland, Longet, Bastian, Schiff, and Ferrier as attempts at explaining these cases, the author considers more at length the theory advocated by Brown-Séquard, though creating the impression of not having entirely appreciated the force of some of that author's arguments. For example, he has interpreted his statement that "it is not possible to look upon paralysis in cases of brain disease as being the effect of loss of function of the part diseased" (*i. e.*, conductors or centres employed by the will in the production of motion), as meaning that "the character of the symptoms in the brain is in no way dependent on the seat of the lesion,"—an interpretation certainly not warranted by the views advanced by Dr. Brown-Séquard in this country last winter (see *Med. Record*), where he gave such precise guides for recognizing the seat of lesion. The impression generally conveyed by the statement above alluded to seems to be "that paralysis cannot be explained as due to the interruption of conduction of motor impulses, for, according to such an anatomical explanation, the same anatomical cause should invariably be followed by the same effect, one such exception should be enough to overthrow this explanation." As regards Dr. Brown-Séquard's explanation as to the production of paralysis through "irritation," Dr. Dickinson thinks that this view is the only one which will satisfy the conditions of "direct paralysis," though he thinks that its acceptance should not entail the abandonment of our views as to the mode of production of the much more numerous cases of crossed paralysis. In other words, Dr. D. occupies a conservative, half-way position, in which, while still holding the doctrine of a physiological crossing of motor paths in the medulla and the ordinary causation of paralysis through interruption of motor conduction, he accepts the "irritative" origin of the "direct" form of paralysis, though, however, even in these instances he clings to the decussation, holding that the irritation is transferred to the side of the brain *opposite* the lesion, and then produces a *crossed* paralysis as it always used to do.

Following this is a paper entitled *A Plea for the more free removal of Can-*

cerous Growths, by W. MITCHELL BANKS, F.R.C.P., and the notes of *Four Cases of Antiseptic Osteotomy*, by W. M. CAMPBELL, M.D., M.R.C.S.

The remaining thirty pages of the volume are occupied by an abstract of the proceedings of the Liverpool Medical Society, for the session of 1875-6, consisting, apparently, of an enumeration of the cases of its members,—cases for the most part utterly commonplace in character, while those which might otherwise have proved of interest are entirely lost through their meagreness of detail.

R. M. S.

ART. XXII.—*A Monograph of Two Hundred and Forty-eight Cases of Latéral Lithotomy Operations*. By RAI RAM NARAIN DASS BAHADOOR, Lecturer on Surgery in the Campbell Medical School, and First Surgeon to the Campbell Hospital, Calcutta. 8vo. pp. 90. Calcutta: Thacker, Spink & Co., 1876.

IF, contrary to the astronomical views and opinions of the Rev. Mr. Jasper, as recently announced from the pulpits of Richmond and other cities, the sun do not move, certain it is that this world of ours does, and it is safe to say that it never moved more rapidly than it does at the present moment. Education, general and special, the arts and sciences, manufactures, commerce, all kinds of discoveries and improvements, are moving on with a degree of velocity alike astonishing and gratifying. Man, although he has only five senses, is, nevertheless, a wonderful being, endowed with resistless industry, vast ambition, and a genius which enables him to penetrate the most profound mysteries of nature. Civilization is rapidly extending its influence, and the day is not distant when substantial contributions, in the various branches of human knowledge, will be made to our stock of information by various nations of the earth at present in a state of semi-barbarism, or still steeped in Cimmerian darkness. The natives of India and Japan are rapidly adopting our language, and the habits, education, modes of life, and even, at least in part, the religion of America and Europe. China, too, is making more or less progress in these directions, and it cannot be long before Africa will take up the march. Wherever commerce and religion penetrate, civilization is sure to exert her influence, and to open new sources of knowledge, wealth, and enterprise. No one, even the most sanguine, can predict what the next quarter of a century may bring forth; we live in an age the most wonderful the world has ever seen; the earth is full of knowledge, and the telegraph, the telephone, and the steam-engine have literally annihilated time and space.

Such thoughts as these naturally suggest themselves to one engaged in perusing the work of a native of India, who, under the influence of an English education, has attained a most enviable rank as a surgical teacher, lithotomist, and practitioner. Mr. Rai Ram Narain Dass, the author of the monograph whose title heads this article, has gradually worked his way up from the most humble to the highest position in his profession. As a student he was greatly distinguished for his zeal and industry in the acquisition of knowledge, especially in surgical science and in analytical chemistry, in the latter of which he took one of the prizes at the annual examinations. After having been for some time in charge of the Cawnpore Government Dispensary, and of the Civil Station of Budaon, Lecturer on Surgery to the Bengalee and Military Classes of the Medical College of Bengal, and one of the House Surgeons to the Fever Hospital, he was transferred to Calcutta, where he has for years filled the chair of Surgery in the

Campbell Medical College, and the office of first Surgeon to the Campbell Hospital. After a brilliant career of nearly forty years, during which, as a teacher and a successful practitioner, he has conferred vast benefits upon his countrymen, he is about to retire from the active duties of his profession, in the expectation of obtaining a pension from the British Government to solace his declining years, his pay as a public officer having always been very limited, never exceeding three hundred and fifty rupees a month. As a lithotomist, his success has been extraordinary. Of 248 cases of lateral lithotomy, performed in the Northwestern Provinces of India during a period of twelve years, only 17, or 1 in 14½, died. For many years he has been a teacher of the native pupils in the Calcutta Medical College, and it is due to him to say that he has done more than any other man in diffusing surgical knowledge through that widely extended country. In 1869, the title of "Bahadoor" was conferred upon him in consideration of his distinguished services; and, in 1876, he received from the Empress of India a certificate in recognition of his position as a distinguished medical practitioner.

The work of Mr. Rai Ram Narain Dass is based essentially upon personal experience, or upon what he himself saw and did during a period of more than a third of a century in a country in which stone in the bladder is of uncommon frequency. After some brief introductory remarks, and the history of some unusual cases, the author treats of the etiology of calculous affections, and then gives a graphic account of the operative part of the subject, winding up with a tabular view of 220 cases of lithotomy, and an account of the chemical analysis of 128 stones, accompanied, in every instance, by a lithographic illustration of their external and internal characters. The labour bestowed upon this portion of the work can be better imagined than described. It must simply have been immense. To render the investigations more complete, the microscope was invariably used. It is a remarkable fact that not one of the calculi examined was found to be simple in character; on the contrary, every one was composed of two or three substances, which were generally of an organic nature, such as uric acid and urate of ammonia, and which almost invariably formed the basis of every nucleus. Inorganic substances, such as phosphates and oxalates, entered into the composition of the outer layer, but only in a few instances into that of the nucleus, and then always in combination with organic elements. Calculi of phosphate of lime or bone earth would seem to be very rare in India, as no specimen entirely composed of this substance was found in the author's collection. It was, however, frequently detected in union with phosphate of magnesia and ammonia, or what is known as the triple phosphate. None of the calculi examined consisted of pure oxalate of lime; and cystic oxide, or cystine, was found only in four specimens, in traces in combination with urate of ammonia and phosphate of lime. It is proper to add that the author, in every instance, gives the date of the operation, and everything of interest or value relative to the physical and chemical characters of the concretions. There is no such thorough account of these matters, so far as the writer's information extends, in any other work.

The etiology of stone has long been a subject of deep interest. It is very briefly discussed by our author. Of 220 cases of stone, operated upon at the Budaon Government Dispensary between April, 1847, and May, 1852, 30 were Mussulmans, and 190 were Hindoos; or in the ratio of 1 to 6. This difference in the liability to this disease in the two castes, the author thinks, is mainly due to the difference in the nature and character of their food. The Hindoos live principally upon vegetables, which, in the Northwestern Provinces, where the complaint is most prevalent, are generally eaten raw; a circumstance which predisposes to indigestion, and to the formation of acid in the alimentary canal. As a consequence of these disorders the urine is constantly surcharged with acid, the

skin becomes inactive, and the kidneys are compelled to eliminate, as best they can, the nitrogenous substances thrown off by the metamorphosis of the living tissues, in the form of uric acid and urea. The author states that the water in the localities in which calculous affections are most frequent, is strongly impregnated with calcareous matter, but he has not been able to trace any direct agency from this source upon the production of stone in the bladder. Geological peculiarities and climate, especially the latter, probably exercise some influence on the origin of the complaint. "The disease is particularly common throughout Rohilkund, and especially in the stony and sandy districts. The temperature of these districts is exceedingly high, and consequently the atmosphere is rarefied, and the oxygenating processes of respiration are correspondingly imperfect; more work is thrown upon the kidneys, and the excretion of urea and uric acid is increased. Moreover, the variations of temperature are great, and the functions of the skin are therefore being constantly interfered with, and additional work is thrown upon the kidneys. Probably, therefore, a variety of predisposing causes, indigestible food, drinking calcareous water, and climatic and geological local conditions, explain the fact that vesical calculous diseases are found to be as common among the people in the sandy and stony districts of the Northwestern Provinces as elephantiasis is in Bengal." In one case, in which a stone was extracted from a Mussulman who had lived on an exclusively animal diet from his earliest infancy, the malady was doubtless caused by an excess of nitrogenous matter in the system. Calculous disease is most prevalent among children from two to ten years of age, particularly among the ill fed and badly clothed.

"Patients whose stones are composed of phosphate and triple phosphate, or even merely coated with these salts, are usually thin, emaciated-looking subjects, with health much impaired, and symptoms which are very agonizing; they suffer more after their operations and are longer in getting well; their urine is always ammoniacal from the decomposition of urea. In the specimens of calculi I examined I found no stone composed exclusively of triple phosphate or phosphate, but I found these salts variously mixed with uric acid and urate of ammonia; in none of the specimens was the nucleus found to be composed of phosphate and triple phosphate.

"Among the specimens of stones examined, not one was found to be purely of the mulberry kind, but the oxalate of lime was found to be variously mixed with uric acid and urate of ammonia: the symptoms of the stone in these cases were very agonizing, but they were not generally emaciated-looking subjects; they were usually of middle age, and after the operation they got well rapidly without much suffering. It was often found that these patients were more afraid of submitting to the operation than others, labouring as they usually did under great nervous depression, a common accompaniment of oxaluria; this nervous depression may even be the cause of morbid action leading to oxidation of a portion of urea and formation of oxalic acid, the oxygen being derived either from the metamorphosis of the living tissues or from increased activity of the respiratory organs.

"After carefully examining my collection of calculi I find that most of the small-sized stones are composed of uric acid and urate of ammonia, variously mixed with each other in the nucleus, as well as in the surrounding laminae; a very limited number of calculi, besides the uric acid and urate of ammonia, contain traces of phosphate of lime, oxalate of lime, and triple phosphate of magnesia and ammonia."

The operation, as performed by Mr. Rai Ram Narain Dass, presents nothing peculiar, excepting that, in dividing the deep-seated structures of the perineum, he takes the staff out of the assistant's hand, and depressing the handle to a level with the axis of the pelvis, completes the cutting part of the operation. The object in depressing the staff is to render the bladder tense, and so facilitate the division of the resisting tissues. The deep incision is made strictly in the line of the external one, and should not be larger than is absolutely necessary for the

easy extraction of the calculus. Mr. Rai Ram Narain Dass deprecates everything like laceration of the tissues; hence he always uses a probe-pointed bistoury to effect their division, if, after the removal of the staff, they are found to offer undue resistance. The stone being removed, and the bladder washed out, a female catheter or gum-elastic tube is inserted in the wound to conduct off the urine, retention being maintained for twenty-four hours in the child, and for forty-eight hours in the adult. When the stone is uncommonly large, or very difficult of extraction, Mr. Dass does not hesitate to extend the incision into the anus, or even into the rectum; and, under such circumstances, he takes special pains to wash out the wound every second hour with tepid water, to prevent the lodgment of fecal matter in the bladder. Under this management the wound rapidly heals, leaving, perhaps, merely a small recto-vesical fistule, which eventually disappears under the occasional application of caustic. He has never lost any patient from hemorrhage, or urinary infiltration; nor has he ever met with an adherent stone, or a stone surrounded by a false membrane, the result of plastic deposit.

It has been already seen that the success of our author has been most extraordinary, the mortality in the 248 cases being only 17, or in the ratio of 1 to 14½. The death-rate in children from two to ten years was 1 in 28; from ten to twenty, 1 in 13½; from twenty to thirty none died; but from this period on the mortality strikingly increased, so that the death-rate from thirty to forty was 1 in 10½; from forty to fifty, 1 in 7; and from fifty to sixty, 1 in 2½. One patient operated upon after sixty, recovered; and one after seventy, died. If we compare the results of these operations with those of other lithotomists, they will be found to be eminently flattering to the skill, care, and judgment of Mr. Rai Ram Narain Dass. Cheselden, the greatest lithotomist of his day, lost 20 cases out of 213; and Liston, another great surgeon, 16 out of 115. Guersant, at the Hôpital des Enfants, Paris, cut 60 children, with a loss of 9. The alleged success of Dudley, who is said to have lost only 6 cases out of 207, is exceedingly problematical, as, it is well known, he kept no record of his operations, and hence could only guess at an approximate result.

We thank Surgeon Dass for the pleasure and instruction we have derived from a perusal of his interesting and valuable monograph; and, although he is no longer young, we shall look for other contributions from his pen in other fields of surgery, embodying, as this does, the results of his large experience.

S. D. G."

ART. XXIII.—*Cyclopædia of the Practice of Medicine*. Edited by Dr. H. VON ZIEMSEN. Vol. XIV.—*Diseases of the Nervous System and Disturbances of Speech*. By Prof. A. EULENBURG, of Greifswald; Prof. H. NOTHNAGEL, of Jena; Prof. H. VON ZIEMSEN, of Munich; Prof. F. JOLLY, of Strasburg; Prof. A. KUSSMAUL, of Strasburg; and Dr. J. BAUER, of Munich. ALBERT H. BUCK, M.D., of New York, editor of American edition. 8vo. pp. xx., 893. New York: William Wood & Co., 1877.

THE diseases of the nervous system form a class which probably occasions more embarrassment to the average practitioner of medicine than any other. And this is true not only of their treatment but also as respects their diagnosis. Symptoms presenting a close resemblance may spring from very different lesions, a fact which is illustrated by paralysis agitans and insular sclerosis; no one having noticed that the trembling in the latter disease only attended voluntary movements until

Charcot pointed out the fact. This is only one of the many instances which might be adduced to show the difficulties which surround the differentiation of nervous disease and the valuable additions which recent observers have made to our knowledge of the pathology of the nervous system. Since none of the text-books in general use at the present time treats of nervous diseases with anything like the same detail, the volume really supplies a want; and since most of the contributors are identified with the subjects they have written of and are probably known by reputation to our readers, it is scarcely necessary to add that it does this well.

To Eulenberg has been committed the task of describing the vaso-motor and trophic neuroses, which include hemicrania, angina pectoris, the so-called Basedow's disease, progressive muscular atrophy, pseudo-hypertrophy of the muscles, true muscular hypertrophy, and unilateral progressive atrophy of the face. The two theories which have been thought to explain most satisfactorily the phenomena of hemicrania are those of Du Bois Reymond and Mællendorff. The former observer, it will be remembered, assumed that certain forms of migraine were caused by a unilateral tetanus of the vessels of the head, or tetanus in the district supplied by the cervical sympathetic. The latter, on the other hand, attributed the pain to a unilateral relaxation of the vessels of the head, from want of energy of the vaso-motor nerves. The author believes, however, that neither of these theories is entirely correct, while they are both partially so, or, in other words, that local anomalies of circulation in the brain, without regard to their special mode of origin, are to be regarded as the essential and universal causal condition, while, on the other hand, tetanus or relaxation of the muscles of the vessels exercises rather an indirect influence, confined to single cases, and acting through the local anæmia or hyperæmia of which it is an important cause. The classes of cases in which there is tetanus of the vessels he distinguishes as hemicrania sympathico-tonica; that in which there is relaxation as hemicrania angio-paralytica, a distinction which he holds is not without its value in therapeutics.

When we turn, however, to the treatment of this disease, we do not find as many suggestions as we had hoped. Caffein, arsenic, bromide of potassium, iron, and quinia, especially in the angio-paralytic form, are among the remedies recommended. In the angio-paralytic form, the author has also obtained very good results from the use of ergotin. On the other hand, in the sympathico-tonic, temporary relief seems to have been procured in some cases by the inhalation of nitrite of amyl. He attributes more influence to the constant current in relieving the symptoms of the disease. Indeed in some cases he believes that it is able to effect a permanent cure. In hemicrania sympathico-tonica the positive pole is placed upon the cervical portion of the sympathetic, at the inner edge of the sternocleido-mastoid muscle, the other one is placed on the palm of the hand and the circuit closed. In the other form the position of the poles is reversed, and he directs that the current shall not only be suddenly closed in the metallic part of the circuit, but shall be made to produce a powerful excitation by means of repeated closures and openings, or in some cases by reversals. It is generally conceded that the induced current exercises no beneficial influence upon the course of migraine.

Dr. Eulenburg allows his patriotic feeling to get the better of his judgment when he assigns to Basedow the credit of having first accurately described the disease which in Germany is generally coupled with his name. Leaving out of consideration the fact that Flajani, a Roman physician, reported in 1802 three cases in which he calls attention to two of the most important of the symptoms, the enlargement of the thyroid gland and the palpitation of the heart; and that Parry in 1825, in a group of cases which he reports, describes one in which in addition to these symptoms there was prominence of the eyeballs, the prior claims of that

great clinical teacher, Graves, of Dublin, ought not to be overlooked, for he appears to have called attention in his lectures to all the leading features of the disease as early as 1835, while Basedow's paper was not published until 1840.

The author, while admitting that the theory which refers all the symptoms of the disease to a primary affection of the sympathetic is very tempting, and that this theory is sustained by the results of post-mortem examinations in certain cases, says that it cannot be accepted unhesitatingly, inasmuch as certain of the symptoms are such as are commonly supposed to follow experimental section, or paralysis of the nerve; while others, on the contrary, might be caused by galvanization, and may be presumed to indicate a permanent condition of irritation. This difficulty would certainly be removed if Benedikt's assumption could be established which refers the struma to an active irritation of dilator nerves which run in the sympathetic. There would remain, however, a second objection which lies in the difficulty of conceiving of a permanent state of irritation continued for years together.

In addition to the remedies in general use in the treatment of this disease, Dr. Eulenburg recommends galvanization of the cervical sympathetic with the constant current. This agent has, he says, in the hands of Von Dusch not only reduced the rate of the pulse from 130 to 70 or 64 beats, but also brought about a diminution in the prominence of the eyes.

The article on epilepsy is by Prof. Notlmagel, of Jena, who treats of the subject at considerable length. He excludes from the category of epilepsy, as indeed do all the principal writers on nervous diseases, all cases of uræmic seizures, and all epileptiform convulsions in which demonstrable gross alterations exist in the cranial cavity, the effect of which taken altogether may be comprised in this, that they either directly or by simple mechanical conditions, occasion an anæmia of the brain substance. On the other hand, in opposition to Reynolds, he maintains that the form of reflex epilepsy ought to be maintained. It is a well-established fact, he says, that in persons who have become subject to epileptiform seizures as a result of a cicatrix or some such cause, these seizures do not occur only or exclusively after irritations of the cicatrix, but also quite spontaneously or after mental changes. The former would necessarily be the case if we had to do with reflex manifestations, and therefore we must assume that in these cases a peculiar change has taken place in the medulla oblongata. The fact, he continues, that recoveries take place after removal of the irritation, cannot be cited as disproving this view, for they generally occur only in cases which come under treatment soon, and in which therefore the epileptic change has not yet become inveterate. Finally, it does not favour the idea of simple reflex convulsions that (except in the case of wounds of the head) the first paroxysm follows only a considerable time, perhaps a week, after the establishment of the peripheral irritation. He thinks, however, it would be better to designate as secondary epilepsy, rather than reflex, all those cases in which an affection of the brain, the spinal cord, or the peripheral nerves is present as a source of excitement and a starting point for the disease, as this name commits us to no theory. The author further regards as epileptic not merely those attacks in which there is complete loss of consciousness without muscular spasm, generally known as *petit mal*, but also those which are marked only by simple dizziness, or in fact by any alteration whatever of the mental activity occurring paroxysmally, such as hallucinations and the like.

The author enters his protest against the use of the term spinal epilepsy, which was originally introduced by Brown-Séquard, even in those cases in which an actually existing epilepsy is developed in consequence of an affection of the spine. In these cases, he says, it has a certain justification, but is superfluous, and had better be replaced by the term secondary epilepsy. But he characterizes it as a misnomer when applied to the clonic and tonic seizures which occur as a symptom

in spinal affections, which remain confined to the extremities or even to the legs, and are unaccompanied by any trace of mental changes. With just as much propriety, he adds, could we speak of a spinal accessory or median epilepsy in the case of clonic twitchings of the muscles of the fingers or of the neck which proceed from a peripheral affection of the median or spinal accessory nerve.

Prof. Nothnagel attaches much importance to hereditary influence in the production of epilepsy. He does not mean of course that the term inherited tendency should be taken in a limited sense, as if strictly epilepsy only in the ancestors led to the redevelopment of the disease in the descendants. On the contrary, it must be taken in a broader sense, and since it is the neurotic diathesis which is inherited, as was long ago insisted upon by Trousseau, the proposition may be enunciated that any neurosis in the parents, whether it be of a lighter or more serious kind, may plant in the children the germ which may develop into epilepsy. Where the disease is inherited, its first manifestations generally occur early in life. It does not appear, however, that mental disturbances occur earlier or more frequently in this than in other forms, the intelligence being more impaired by a frequent recurrence of the attacks than by any other cause.

Compared with inherited tendency all the other influences which affect the organism or the nervous system as a whole sink into insignificance as causes of epilepsy. It may, indeed, be asserted that most of these are without the power to produce the central change upon which the disease depends, and that in cases where they have seemed to do this, they have merely acted as the exciting causes of the first attack.

The author does not regard the prognosis of epilepsy as necessarily hopeless, although unable to verify by experience the very favourable results of Herpin, according to whom fifty per cent. of all epileptics are curable. Unquestionably a certain number recover spontaneously. Others get well upon the removal of the cause, and others are restored to health by means of appropriate treatment. The last are, however, a very small proportion of the whole number; the prospect of recovery being of course best in those cases in which treatment is begun soon after the first appearance of the seizures. It is said by Herpin to be good also in those cases which first begin after the fiftieth year.

When speaking of the treatment of epilepsy, Prof. Nothnagel says our success will depend very much upon the judgment with which we select the remedies appropriate to the case in hand; but it is to be regretted that he does not lay down any positive rules for our guidance. Indeed, beyond telling us that iron is to be given to anæmic patients, that plethora only requires treatment when excessive, and that the oxide of zinc is most efficient with patients under twenty years of age, he gives us none at all. It need hardly be added that bromide of potassium is the remedy upon which he places most reliance, saying of it, that, while it is not an infallible, sovereign anti-epileptic, it is certainly of more service than all other remedies. In some cases in which it failed to produce any good results, an improvement followed its use when given in combination with oxide of zinc. The cold-water treatment vigorously followed out has also sometimes in his experience been of great service.

In the course of his article on chorea, Prof. Ziemssen takes occasion to assert his belief that "the group of symptoms called chorea major is not a disease *sui generis*, but is only the product of genuine psychores and cerebral maladies on the one hand, and of hysteria and wilful simulation on the other," a conclusion which is certainly true of the great majority of the cases. As regards the connection between rheumatism and chorea the author says that their coexistence is so frequent as to indicate that they are the same affection under two forms. In common with most other writers, he places the seat of the changes upon which

the disease depends in the brain, and especially in the great ganglia at its base, and says that these changes are induced, in some cases at least, by embolic processes. He admits, however, that there are others which cannot be explained in this way.

The remedies upon which the author relies principally in the treatment of chorea are arsenic and hydrate of chloral given in decidedly larger doses than usually recommended. On the other hand, he speaks disparagingly of the bromides and electricity, and only doubtfully of the cold-water treatment.

A very full description of hysteria, by Jolly, follows the article on chorea, in which the reader will find the various phases under which this chameleon disease presents itself fully considered. And to this succeeds an elaborate essay, occupying nearly a third of the volume, by Kussmaul, on Disturbances of Speech—an Attempt in the Pathology of Speech. We can recommend this most cordially to the student's attention, but unfortunately it is impossible to analyze it or even to criticize it within the limits allowed us for this notice.

J. H. H.

ART. XXIV.—*Vortraege aus dem Gesamtgebiete der Augenheilkunde für Studirende und Aerzte.* Von Dr. LUDWIG MAUTHNER, K. K. Universitäts-Professor in Wien. Erstes Heft: *Die Sympathischen Augenleiden.* Erste Abtheilung: *Aetiologie, Pathologie.* 8vo. pp. 58. Wiesbaden: J. F. Bergmann. New York: B. Westermann & Co., 1878.

Lectures on Ophthalmology for Students and Physicians. By Dr. LUDWIG MAUTHNER, Imperial-Royal University Professor in Vienna. First Part: *Sympathetic Diseases of the Eye.* First Section: *Etiology, Pathology.*

THESE lectures or clinical studies by Professor Mauthner, of which this is the first instalment, will embrace the entire field of ophthalmology, and will appear from four to six times a year, at irregular intervals. Their author is one of the most scientific of living ophthalmologists, and his purpose of so popularizing the study of diseases of the eye as to be of interest and profit to all classes of medical men, will prove eminently successful, if we may judge from our personal knowledge of the man, and from a perusal of this first part of his work.

The brochure of 58 pages treats in the most masterly manner of the etiology and pathology of the sympathetic diseases of the eye, and the conclusion of this branch of the subject will appear in the second part of the work, which is shortly to be published. Mauthner begins with a most excellent definition, as follows: "Those diseases or affections which are produced in one eye by disease in the other, in which the disease of the first eye is the sole cause of disease in the second eye, are termed *sympathetic*;" and if we stand rigidly by this definition, we shall make but few mistakes in diagnosis.

Mauthner devotes a short preliminary section to the coarse or topographical anatomy of the eyeball, with special consideration of the so-called ciliary region, and then proceeds to discuss the various lesions which may lead to sympathetic trouble. Lesions of the ciliary region may be spontaneous in origin as well as traumatic, though the latter are the more frequent. The danger of injuries in this region is certainly very great, and not unfrequently the most unfortunate results follow operations here.

Mauthner also calls attention to the fact that traumatic lesions of this region may spontaneously turn out well, and a good result may be reached, and gives the history of an interesting case of this kind. Even where a foreign body has

remained imbedded for years in an eye, causing from time to time violent inflammation, but without setting up any sympathetic trouble, it may finally bring about perforation of the eyeball and its own elimination during a violent inflammatory attack.

Injuries in the ciliary region Mauthner divides into accidental and operative. Under the former head he considers the imbedding of a foreign body in the ciliary body; injury of the ciliary body by pointed or cutting instruments without remaining imbedded here; bruising and tearing of this region by blunt objects; incised, punctate, and lacerated wounds of the corneal margin, with or without injury of the ciliary body, with prolapse of iris or ciliary body in the wound; finally contusions of the eyeball in this region. Mauthner recognizes the fact that a foreign body may remain free or encapsuled in any part of the eye for many years without causing any trouble, but believes that sooner or later conditions will arise that may threaten sympathetic trouble. He then gives a simple yet admirable sketch of the various severe symptoms of inflammation following an injury, from the deep pericorneal injection through all the stages to phthisis bulbi or atrophy of the eyeball. In this prolonged process, cyclitis plays an important part, and is the last to die out, for the region of the ciliary body remains sensitive and painful, even after pronounced atrophy has appeared.

In speaking of the serious results which sometimes follow operations, Mauthner considers at length the operation of iridectomy for optical purposes, its failure to produce the desired effect, and the introduction of the operation of iridodesis in its place. This was first regarded as absolutely harmless, but since 1863 a large number of cases have been published in which bad results followed the operation, and in not a few of these was sympathetic inflammation of the fellow eye a result, directly traceable to the operation.

He then takes up the subject of extraction of cataract by the flap method, as well as by the peripheral linear method of von Graefe, and proves that the latter has much more frequently been the indirect cause of sympathetic irritation than the old flap method. The subject of idiopathic inflammation of the ciliary body and choroid is considered next, its rarity recognized, and yet its undoubted influence in causing sympathetic trouble plainly affirmed, and reference is made to the cases of Noyes and Jeffries, in which the sympathetic irritation arose from herpes zoster ophthalmicus of the opposite side. From all that has gone before, it is plain to see that the disease of the uveal tract under consideration is an insidious, more or less chronic, plastic inflammatory process. But Mauthner very justly takes up the following questions: 1. Can a violent purulent inflammation of the uveal tract lead to sympathetic trouble? 2. Can this occur when the ciliary body is not involved, nor the ciliary region sensitive to the touch, the iris or choroid alone being inflamed? 3. Finally, can sympathetic trouble be produced without disease of the uveal tract? The first of these he answers in the affirmative, and corroborates his own view by cases reported by Mooren and Rosander, and by the pathological report of Arlt. The other two questions receive also a most emphatic affirmative answer, especially from the side of microscopical and pathological investigations.

In addition to these points, Mauthner brings up a still more important question, which has recently been the subject of much discussion, viz.: If in the case of traumatic cyclitis, without the presence of a foreign body, the inflammation has not led to atrophy of the eyeball, but has ended in complete recovery, can, *subsequently*, sympathetic trouble break out in the fellow eye? He considers the subject by citing a case in detail, and concludes that even such a favourable result of an injury is no sure protection against sympathetic trouble.

In the second part of this brochure the author considers briefly the various forms in which sympathetic trouble may present itself, carefully distinguishing between sympathetic irritation and sympathetic inflammation. If at the time of the sympathetic irritation there is no actual disease present, we must consider it a case of irritation of the ciliary nerves, and Mauthner is inclined to look for the primary affection in the retina, which produces a reflex neurosis of the ciliary nerves, and hence the asthenopic symptoms. At the same time he admits that primary ciliary neuralgia may precede sympathetic trouble, but in such cases the ciliary region is sensitive to pressure. When the sympathetic trouble is situated in the optic nerve and retina, there may be the most violent photophobia, photopsia, and blepharospasm, with marked functional disturbance, without there being any demonstrable lesion present. Mauthner then considers the subject of sympathetic inflammation with all its protean manifestations, which is always preceded by the signs of irritation. He gives an exceedingly clear and accurate description of serous and plastic iritis with corneal complication, and very justly differentiates strictly between membraniform obstruction of the pupil and absolute closure of the pupil by broad, continuous posterior synechiæ. This distinction is too often neglected in ophthalmological writings. The former obstructs the passage of light, but does not necessarily injure the eye. The latter offers no obstruction to the rays of light, but is a source of constant danger to the eye. The consequences of this latter condition, and its almost constant termination in destruction of the eye, are admirably presented. To the plastic form of inflammation, involving both iris and ciliary body, Mauthner gives the name "maligna," and with justice, for it may be said that all treatment is useless, and unfortunately it occurs more frequently than the other forms of sympathetic inflammation. He states positively that the "iritis serosa" must not be regarded as heralding the "plastic" or "malignant" forms of inflammation; that the former has no tendency to change into the latter, and may even result favourably without resorting to enucleation of the eye first affected. He then makes the bold assertion that when an "iritis serosa," after enucleation, assumes the more dangerous plastic or malignant forms, it is because the enucleation has *excited* a new sympathetic process.

The combination of choroiditis and retinitis as a form of sympathetic inflammation is fully recognized by the author, who gives it a degree of importance which it has not until very recently received. Sympathetic retinitis, he thinks, occurs oftener than has hitherto been believed. The question of sympathetic affections of the optic nerve he regards as still very obscure, though he thinks that simple atrophy of the nerve may be of sympathetic origin.

Mauthner regards the occurrence of acute glaucoma as a sign of sympathetic inflammation as very doubtful, and up to this time not proven. By this he means primary glaucoma, with the acute inflammatory symptoms peculiar to it. He admits the occurrence of glaucomatous symptoms, especially increased intraocular tension, in the course of an iridocyclitis, but this is not primary glaucoma.

The first part is brought to an end by a *résumé* of its contents, and is an admirable piece of work.

C. S. B.

ART. XXV.—*Beiträge zur Praktischen Augenheilkunde*. Von Dr. J. HIRSCHBERG, Docent an der Universität zu Berlin. Hefte I., II., III. Berlin: Hermann Peters, 1876. Leipzig: Veit & Co., 1877 and 1878.

Contributions to Practical Ophthalmology. By Dr. J. HIRSCHBERG, Lecturer in the University of Berlin. Parts I., II., and III.

IN 1874 Dr. Hirschberg published a small monograph entitled "Clinical Observations," and in 1876 the first part of the present work, "Contributions to Practical Ophthalmology." There are six chapters in this first part, in which are considered certain diseases of the conjunctiva, cornea and sclera, uveal tract, optic nerve and retina, lens, nerves, and muscles, from a clinical and therapeutic standpoint. The observations are based on nearly 10,000 cases occurring during the years 1873, 1874, and 1875. The first section treats of blenorrhœa neonatorum and diphtheritic conjunctivitis, and Hirschberg considers that in the vast majority of cases the cause is infection during parturition by means of some secretion in the genital passages of the mother. He uses the term "ophthalmia neonatorum" as descriptive, and includes under it simple conjunctival catarrh, as well as exanthematous conjunctivitis from congenital syphilis, and some other affections. He cites some cases of kerato-malacia, or simple suppuration of the cornea, without any conjunctival affection, occurring in young children with general marasmus, and points out that this is a process to be carefully differentiated from corneal suppuration occurring with blenorrhœa. His treatment of blenorrhœa agrees with that of most authors—iced compresses and cleanliness for the slight cases, cauterizations with silver nitrate for the severer forms, varying in strength from a solution of $1\frac{1}{2}$ per cent. to the use of the lapis mitigatus. The cases of diphtheritic conjunctivitis were almost all slight, and most of them recovered completely by the simple use of iced applications and bran poultices. The section on abscess of the cornea and keratocoele contains nothing new of importance.

In speaking of cyclitis deformans and its treatment, Hirschberg emphasizes very justly some rational ideas, which are the outgrowth of experience. He regards the only proper treatment to be the enucleation of the inflamed eye as a preventive of sympathetic inflammation, as all intra-ocular operations on eyes blinded by inflammation of their inner coats involve very great danger of sympathetic ophthalmia. This the reviewer regards as sound doctrine, for such eyes must certainly be classified as among the "noli me tangere" cases of ophthalmic surgery.

On the subject of glaucoma, Hirschberg regards the relative frequency of the hemorrhagic form as very great in his own experience. These cases are of the most malignant type.

Under the head of diseases of the optic nerve and retina, Hirschberg gives the histories of two interesting cases of degeneration of the optic nerve from intra-uterine deformity of the skull. The skulls were very high and narrow, as if compressed laterally, and the interpapillary slit resembled the Mongolian conformation.

The author regards diffuse syphilitic retinitis as very amenable to treatment, if it is carried on for a length of time in a darkened room, and even in the worst cases, a complete restoration of vision is possible. He cites six cases with successful result; and a study of them shows several points of interest. The subjective prodromal signs may precede by a long period the clouding of the retina and disturbance of vision. Another case showed that rapid improvement may take place after two years of constantly increasing amblyopia.

The last section in this first part is a short, practical article upon the subject of squint, with a report of five cases, and tables showing the result of careful examinations before and after the operation, of the muscular dynamics of each eye, with a view to the more exact dosing of the operation. The absolute necessity of a quantitative analysis of the squint and of the squint-operation is often not sufficiently appreciated.

The second part contains the seventh annual report of Hirschberg's clinic, as well as papers by Hirschberg on "The Use of the Lance-headed Knife in the Extraction of Cataract," on "The Measurement of Refraction and a new Optometer;" a short paper by Thel on "Examination of the Upright Retinal Image;" articles on "Enucleation," and "Weber's Method of Extraction," by Pufahl, and "Clinical Notes," by Rother.

Hirschberg speaks favourably of extraction with the lance-knife, only he prefers a flat blade instead of Weber's concave one, and the knife must be a broad one. The advantages he claims for the method are rapid closure of the wound and consequent early restoration of the anterior chamber.

Hirschberg's optometer consists of a combination of two convex lenses of short, but different focal length, which produce an inverted image of an object. Hence in testing a patient's refraction, the test-types must be placed upside down. In its practical application, if it is desired to produce a sharp image of the types in an emmetropic eye, the distance between the two convex lenses must be equal to the sum of the focal lengths of the two lenses. If the eye examined be myopic, the distance between ocular and objective must be less than the sum of their focal lengths, and greater than the focal length of the first. If the eye examined be hypermetropic, the distance between the ocular and objective must be greater than the sum of their focal lengths. These changes are made by altering the length of the tube containing the lenses by means of a screw. The instrument may be used for one eye, or two. Another advantage claimed for it by Hirschberg is, that it admits of a convenient and sure control of the results of examination, when based on a patient's statements. If the optometer is reversed so that objective and ocular change roles, the constants are changed, and have a different value, so that a very different distance between the lenses is necessary for a given ametropic eye. Hirschberg also gives a table containing all the necessary calculations for making and corroborating the examinations. Not to be behind other ophthalmologists, the world over, Hirschberg has also constructed an ophthalmoscope of his own, which only differs from several of the modern examples, in having fewer glasses, and these twice the diameter of those in ordinary use; modifications which have no practical value.

Thel's paper on "Examination of the Upright Retinal Image" consists of a mathematical determination of the proper correcting glass for the upright image, with the necessary tables and directions how to use them; and of a discussion upon the enlargement of the upright image.

Pufahl's article on "Enucleation of the Eye" is short, and contains nothing of special interest.

This second part concludes with the statistics of treatment and operations during the year, and short clinical notes of some interesting cases.

The third part contains the eighth annual report of Hirschberg's clinic, a statistical report of all the cases treated at the clinic from 1871 to 1877, and several interesting papers by Hirschberg.

In a paper on "Hemianopsia," Hirschberg reviews the history of the discussion of the very important subject, the course of the optic nerve fibres in the chiasm of man, and gives an exhaustive epitome of the views held by different authors from Galen to the present day. He calls attention to the extreme importance of

autopsies in cases of typical hemianopsia, with a view to the elucidation of the much-discussed question: "Is the decussation in the optic chiasm partial or complete?" He concludes by laying down as necessary postulates of the theory of semi-decussation, which he upholds: first, that homonymous hemianopsia occurs most frequently, is sharply defined, and may be stationary, that is it may not involve the intact halves of the visual fields; secondly, that crossed temporal hemianopsia is relatively rarer, not so sharply defined, and is progressive; thirdly, that nasal hemianopsia never occurs.

In a paper on the "Changes of the Fundus Oculi in General Anæmia" Hirschberg distinguishes in the fundus three varieties of pathological appearances.

1st. The optic papilla of both eyes becomes pale, the retinal vessels remaining unchanged, and later becomes almost as white as in extra-ocular atrophy, but without the sharply-defined limitation of the disk. The vision is unchanged unless disturbed by exudation or hemorrhages into the retina. This change occurs both in pernicious and curable anæmia.

2d. In chronic anæmia, whether pernicious or secondary, following loss of blood, the optic papilla becomes cloudy-white, the vessels are narrowed, especially the arteries, and cannot be followed distinctly for any great distance beyond the margin of the disk. There exists a delicate optic neuritis without much disturbance of vision. Hemorrhages and exudation may occur as well here as in the first variety.

3d. A few days after the loss of blood there may occur a pronounced neuroretinitis, without any premonition, with great exudation and numerous hemorrhages, and disturbance of vision, which may lead in a few days to absolute amaurosis.

He gives the histories of a number of cases, which illustrate the three forms of change.

The third paper, by Hirschberg, is on the "Elementary Description of Gauss's Dioptries of Spherical Surfaces," and is purely mathematical.

The last paper is by Pufahl, and consists of rather voluminous clinical notes of interesting cases, among which we may note a case of granuloma iridis, one of choroidal tubercle, several of congenital changes in the optic nerve, one of intra-ocular cysticercus, and two of diabetic cataract.

These brief publications contain many points of interest to ophthalmologists, and are to be continued periodically.

C. S. B.

ART. XXVI.—*Ninth Annual Report of the State Board of Health of Massachusetts.* 8vo. pp. xl., 529. Boston, 1878.

THIS Report comes loaded as usual with valuable and interesting matter. From the general report which occupies the earlier pages, as well as from passages in several articles treating of the sanitary condition of special localities, we learn that saturation of the soil with various forms of filth has become a most important and active source of injury and danger to the public health in many of the towns. The State is one of the most densely populated, and oldest in the Union. The natural tendency has been for a progressively increasing contamination of its soil, and consequently of its air, and its waters from wells or rivers. In some districts where the underlying rock is but thinly covered with soil, and sometimes so disposed as to retain sewage, or to conduct it into wells or other sources of water-supply, this cumulative pollution is pretty clearly shown to exert a decided and baneful effect upon the public health. Contamination of the rivers,

too, tends to become worse and worse. Unfortunately, too, the protection of the soil from growing impurity seems practically attainable, in many cases, only through still further use of the streams as carriers of sewage. The dilemma is a grave one, and not wholly susceptible of a satisfactory disposition. Of one fact, however, the Board entertain no doubt, viz., that the present danger from pollution of rivers is much less in Massachusetts, to-day, than that from soil-saturation, with its associated poisoning of air and of well-water. Thus it comes about that the pollution of streams, great evil though it be, is rather to be regulated and controlled, than attempted to be utterly prevented.

The ascertaining of the impurity of well-waters in different parts of the State, forms an important part of the last year's work of the Board. The results of the investigation are rather startling. They are, however, very temperately interpreted—it being freely admitted that foul water is, practically, oftener a favouring condition, than an actual cause, of disease. Among the points most clearly brought out in these researches we may note these: that very bad water is often clear and tasteless; that public water-supply, without a system of sewers, is sometimes productive of more harm than good; and that the connection of houses with the sewers, unless very judiciously planned and performed, may also prove more a cause of disease than a preventive.

Dr. Adams, of Pittsfield, gives a brief and suggestive account of an experiment there made, in the way of "cottage hospitals," for general medical and surgical cases. There certainly are strong arguments in favour of small hospitals, scattered through the country, homelike, and near to the homes of the patients. We can easily conceive, too, that some grave objections towards small receptacles for the insane do not hold as regards institutions such as we have described. The experimental test, at least, is not very difficult, nor very expensive, and affords to the beneficent an opportunity to do good near home, and to guide the workings of their own charities. Certain social peculiarities of our people, which in practice render resort to the great city hospitals very rare on the part of the rural population, would seem to point to an even greater usefulness for such local charities, here, than in England, where the plan has been somewhat extensively followed.

Prof. Nichols, the distinguished chemist of the Technology school, treats at considerable length of "Filtration of Potable Water." A clear statement is made as to the character of the impurities capable of removal. Attention is drawn to a somewhat prevalent muddiness of men's ideas as to the solution, or the suspension, of foreign matters in water. The nature and scope of natural filtration, by which the water is collected only after passing through filtering strata of Nature's arrangement, is explained as a preliminary to a somewhat full description of the various combinations of materials by which men have copied the natural process, both on a large scale and for the single household.

As the results of foreign and domestic experience, and of experimental investigation by the writer, the following conclusions, with others, are arrived at. Sand is the only agent largely available for filtration, in supplying cities and towns. Such filtration, while it may remove a portion of matter in solution, and perhaps all that which is merely suspended, cannot be regarded as rendering a polluted water safe. Any systematic attempt at purifying a water-supply requires not only a considerable outlay for the construction of works, but also an enlightened supervision, and a continued expenditure, to keep the filters in an effective condition.

Household filtration is treated of with some minuteness of detail. Animal charcoal is regarded as the most effective purifying filter. The chief practical troubles are, first, that a filter which is efficient delivers the water very slowly, and second, that there is constantly going on a process of clogging and fouling

which requires incessant care, either to maintain the purity, or the transmission, or both.

Various combinations and methods of artificial filtration, on large and small scales, and adaptations of natural filtration to the purposes of water-supply, are described in detail, illustrated by wood-cuts, and tabular statements given of the kind and amount of purification attained in different cases.

An excellent feature of this paper, as of some of its companions, is a directory to the literature of the subject, which must prove of great assistance to any one having occasion to make thorough investigations at short notice.

Dr. D. F. Lincoln, continuing a line of investigation in which he has previously elicited startling facts, treats of the sanitary conditions of public schools, including their agency as disseminators of contagious diseases. The method, so much employed by this Board, of circular letters of inquiry, has here again been used to collect facts and opinions from all parts of the State. The questions were addressed, not to teachers, but to prominent physicians who had consented to act as "medical correspondents" of the Board. While confirming the views formerly expressed, by Dr. Lincoln and by others, in different parts of the country, as to the general existence of unwholesome conditions, in and around our schools, this paper requires no especial comment in addition to what we have recently said in other connections. The evils which cluster about our schools, dependent on construction, location, and management, are certainly very real and very grave. Neither physicians nor parents should ever cease to critically examine the conditions under which so many hours of children's lives are daily passed.

Dr. A. H. Johnson, of Salem, has prepared an article upon scarlet fever. It is designed to convey to all intelligent readers such knowledge of the nature and conditions of the disease as may enable them to take all proper precautions against its occurrence and its communication. A good deal of space is devoted to the importance of disinfection,—of clothes, other portable articles, furniture, and the sick-rooms. The methods by which this can be best accomplished, and the spread of the malady prevented, are here treated in a very practical and useful way. This is one of the papers whose general circulation, in the form of a cheap tract, might be of great service. The amount of imprudence and carelessness, to give it no worse name, displayed by friends and the public, in connection with infectious diseases, especially of children, would seem almost incredible, if not daily witnessed. Surely a large proportion of our people need only such enlightenment as is here presented to abandon customs and practices which have hitherto done very much to multiply cases of this terrible class of maladies.

Continuing a plan some years ago adopted of presenting somewhat elaborate statements of the sanitary condition and influences of the larger towns and cities of the State, we find in this Report an examination into all the circumstances affecting the health of the university town of Cambridge. The flatness of its territory, but little elevated above tide-water, the vicinity to marshy districts, and the character of the subsoil, are unfavourable to general healthfulness. Certain wards have a high death-rate, and are a constant menace to the more favoured localities. As a whole, however, the mortality is not excessive.

The usual extracts from reports of correspondents from all over the State, given collectively under the title "Health of Towns," are here presented. The questions, to which especial attention had been called, are omitted—inadvertently we suppose. The average of health as compared to former years is referred to by nearly all reporters. The general testimony is to a remarkably high state of health for the year 1877. The very few exceptions are almost invariably caused by some one epidemic disease, usually diphtheria. Boston shows a death-rate of 20.72 in 1000, against 23.84 in 1876. The temperature of the year was higher,

but the variations were less. The very warm December, so generally deemed "unhealthy" by the public, shows a very low mortality. The chief gain was in the fall and winter.

Diphtheria, while occasionally sparing a town, or appearing in a much milder form than in some former year, furnishes a very large proportion of the sickness and death throughout the State. We cannot perceive any uniformity in the reports as to its greater or less severity of type during the year. In one town the cases may have been generally mild, and in the next perhaps unusually severe. And where it was very fatal one year, it was very slightly so another. In Boston, while only about two-thirds as fatal as in 1876, it furnished nearly five per cent. of the total mortality.

While there is a very large amount of testimony towards the general existence of filth or bad drainage, as an element in the causation of this disease, there is also much positive evidence that the disease sometimes appears amid the most favourable surroundings. In the terrible epidemic prevalence of diphtheria in Gloucester, it was moreover observed that some of the worst localities were almost exempt.

Many very curious instances are given of the methods by which infection has been carried—but for these we lack space. It is evident however that the profession throughout the State are startled and alarmed at the amount and fatality of diphtheria of late years. In Taunton there were 93 deaths from diphtheria, out of a total mortality of 433. In Lawrence out of 875 deaths 117 were due to this cause, or 13 per cent. Lynn shows about the same figures, absolute and relative. In Gloucester also, the deaths from this cause have been about 15 per cent. of all, while in 1876 alone, the rate seems to have been nearly double that. Among smaller towns, we meet one with a mortality of 86, of which 24 are attributed to this disease. In another, about the same number from diphtheria, out of a total mortality of 175. In others, we find 12 out of 62; 10 or 12 out of 100; 5 out of 42, 14 out of 94, 10 out of 70, 6 out of 42, etc. These figures, which are mere examples, will well account for the attention paid in this report to diphtheria.

Other zymotic diseases do not present any especial claims to notice. Typhoid fever, however, is several times noted as less frequent, generally in connection with mention of improved water-supply. In one town it is said to be nearly confined to people who persist in using well-water. Particular cases, especially where several occur in one house, are generally attributed to bad water.

Phthisis is in several instances noted as furnishing less proportionate mortality than formerly; and this, in one or two larger cities, is attributed to the diminished number of Irish emigrants since the "hard times." This class have been known for some years to contribute more than their numerical proportion to the deaths from consumption.

Two deaths from bites of rabid animals are noted; the first from a dog—not fully reported; the second from a cat, was possibly pseudo-hydrophobia.

In connection with an alleged increase of consumption in a manufacturing town, occurring principally among young Irish mill-hands, it is stated that "snuff-dipping" is a vice almost universal among the female workers.

A special report deals with diphtheria as it appeared in Gloucester for a few years past. We will return to this subject only briefly to note the peculiar local conditions. The soil is very thin, superimposed upon solid granite, or occasionally upon clay. After rising somewhat abruptly from the seaside, the surface is undulatory, causing marshy spots and damp cellars. For two centuries, all excrement has been placed in rudely built privies. Wells, necessarily shallow, owing to the underlying rock, have provided drinking water. Believing that there must exist contamination of this water, the Board sent specimens from thirty or forty wells to Prof. Nichols for examination. "Do people actually drink this water?" was

asked by the astonished workers in the laboratory. One sample is stated to be worth for manure "twice as much as ordinary sewage," but this well had for some time been abandoned. Two specimens—equal as fertilizers to the contents of the Pittsfield sewers, the first from a well in use by three families who are "always well," and the second from a well constantly used from birth by a family of exceptionally robust children—are mentioned as proof that foul water *alone* will not cause diphtheria or other disease. Yet not only these, but all the waters tested, were pronounced unfit for human consumption. In spite of the extraordinary exceptions above noted, we presume our readers will agree with the Board in believing that there is some connection between the diphtheria and the water, in the sea-girt peninsula inhabited by hardy fishermen and their industrious and intelligent families.

One or two other special reports, and a tolerable index, complete this excellent Report. Many matters of great interest we have been obliged to touch hurriedly or to ignore entirely. The work is an acquisition to any medical library fortunate enough to get it.

B. L. R.

ART. XXVII.—*Transactions of State Medical Societies.*

1. *Transactions of the Medical Association of Georgia*, April, 1878, pp. 279. Atlanta, Ga., 1878.
2. *Transactions of the Mississippi State Medical Association*, April, 1878, pp. 168. Jackson, Miss., 1878.
3. *Transactions of the Iowa State Medical Society*, May, 1877, and Jan. 1878, pp. 196. Des Moines, 1878.
4. *Transactions of the Vermont Medical Society*, June, 1877, pp. 88. St. Albans, Vt., 1878.
5. *Transactions of the Rhode Island Medical Society* for 1877 and 1878, pp. 49. Central Falls, 1878.
6. *Proceedings of the Connecticut Medical Society*, May, 1871, pp. 234. Hartford, Conn., 1878.

1. WE regret to learn, from the *Georgia Transactions*, that the recently organized Health Board of that State has been rendered, of late, practically inoperative, through the short-sighted parsimony of the Legislature. The liability to occasional invasions of yellow fever, should alone amply justify, to the dullest law-giver, the expenditure necessary to maintain the Board.

Dr. Walker reports the delivery of a dead fœtus, apparently of two and a half months, coincidently with a fully developed and living infant. A discharge of fluid, supposed to be amniotic, had occurred one week before the final labour. The doctor believes that the younger embryo ceased to live at this time, and that it was, as it appeared, the fruit of conception occurring during advanced pregnancy. It was delivered after the living child, and before the developed placenta. A cord some six inches in length was attached to it, but no separate placenta, nor any connection with the other cord or membranes could be detected.

Professedly limiting himself to the disease as observed in the epidemic of 1876, Dr. Le Hardy examines with some minuteness the history of yellow fever, as prevailing in Savannah, from its earliest appearance. He believes the disease can and does originate on the spot, independently of any importation. High temperature with great humidity of air, in connection with stagnant waters upon the rice-swamps, furnish the conditions under which the disease is born. Quarantine or the imposing of long seclusion and delay upon persons and cargoes from in-

fected ports, he believes to be useless. All good purposes can be effected in a few hours, by "modern scientific disinfection."

During seventy-five years, previous to the beginning of rice cultivation, the writer says yellow fever was unknown; while malarial diseases generally are represented to have been little prevalent. Yet communication was frequent with Charleston and the West Indies, where the fever was respectively epidemic and endemic. Early in the present century, however, the swamps around the city began to be extensively cultivated, especially for the growth of rice; and there is reported to have occurred a very marked change for the worse in the sanitary character of the place. Then only did the yellow fever begin to appear. It does not seem to have been distinctly separated by physicians, at first, but is spoken of as a malarial fever of a continued type, *ending in black vomit*. Another alleged fact would seem to possess great significance, though not here quite clearly set forth—experiments made on certain years in what is called the "dry culture" of the rice, seem to have uniformly coincided with freedom from this fever, and with a general high standard of health.

While not denying the theoretical possibility of imported cases being the exciting cause of local cases, under suitable conditions, the writer points to the actual rarity of such instances in the oldest records; also to the frequency with which the former cases have run their course without causing the latter; and to the fact that while in the West Indies yellow fever prevails in March, April, and May, it never appears in Savannah till the end of July, or generally later.

We are not quite sure that we understand the author's views as to the nature of the malady in question. He expresses with much emphasis a belief in the "malarial" character of the disease. Often in speaking of the fevers of certain years he conveys the impression of the yellow fever being merely a more extreme expression of the same poison which produced the intermittent, due to great heat and other intensified conditions. And yet he seems inclined to believe that he has identified a particular fungous growth with *yellow fever*. Surely it is hardly reasonable thus at once to imply identity and difference.

Thorough drainage of the city and the surrounding marshes—including, we presume, abandonment of the "wet culture" of rice—is designated as the only effective prophylaxis. Hot mustard baths, with frictions, a ten-grain dose of calomel, followed by a laxative, with perhaps a bland emetic, followed by an epigastric sinapism, were found the best treatment at the outset of most cases. If needful, to restore circulation and cause sweating, the baths were repeated, taking care to have the patient wrapped in a steaming blanket while in transit to his bed. Quinia in five- or ten-grain doses was then commenced and continued from two to four days, or till the temperature became normal. When irritability of the stomach was extreme, resisting ice and effervescent, entire rest was given it, a blister applied to epigastrium, and nutrient enemata given. Beef-tea was the food preferred, given either from above or below. When enemata only were relied upon, an egg and fifteen or twenty grains of sulphate of quinia were given, with a half ounce of the tea every four hours.

Dr. Calhoun, in presenting the lessons of his experience in 130 operations for strabismus, notes the extreme rareness of this affection among the negroes. Myopia and presbyopia are also very rare in this class.

Besides an instructive report on Gynæcology by Dr. A. W. Griggs, we have a useful paper upon the use of uterine tents by Dr. W. T. Goldsmith, and one on the application of pressure in uterine diseases, by Dr. V. H. Taliaferro. The last-mentioned paper is a peculiarly practical and, we incline to believe, useful one. Having discovered, as it were by accident, that the support and pressure exerted on the vessels and tissues of a lax, enlarged, and congested uterus, by a very tightly

tamponed vagina, caused a wonderful return towards a normal tonicity of the flaccid organ, Dr. T. continued the treatment with excellent effect, and applied his new idea to other cases. He summarizes the action of the tampon as follows: diminishing blood-supply and nutrition; promoting absorption, and the destructive metamorphosis of redundant tissue; lessening nervous action; and rectifying malpositions. Thus it is eminently applicable to the conditions expressed by the ternis, subinvolution, hypertrophy, hyperplasia, congestion, chronic inflammation and its products, fibroid growths, and uterine hyperæsthesia. To obtain the best results the vagina must be dilated by placing the patient in the knee-elbow or knee-chest posture, and the filling must be very complete and uniform. Carded sheep's wool in pledgets is recommended as the best material—having been duly disinfected. One or two pledgets in immediate contact with the os may be of cotton batting, soaked in glycerine, for the sake of its osmotic action and its disinfectant virtues. The tampon requires renewal about once in three days. The treatment may continue weeks, or even months, with intermissions at the menstrual periods. If the first applications are a little less tightly packed, irritation of the vagina is seldom caused, while the relief to vomiting, pain, and other distressing symptoms is often wonderful.

Contrasting the advantages of this treatment with that by cauterics, scarifications, etc., the writer claims great success. The complete control indirectly exerted over sexual intercourse, is, moreover, no small gain. The ability of the patient to move about with undiminished and even increased ease, is another great advantage. There is no destruction of mucous membrane, and no contracting cicatrices, as after the use of acids and other irritants.

Dr. Goldsmith, besides giving a somewhat full statement and illustration of the uses of tents, especially recommends a new material of his own suggestion—the pith of the common corn-stalk, in a dry or ripened state. This he believes to possess the desired qualities in a higher degree than any other substance used.

Dr. Gray had recently an opportunity to examine the head of a young negro, who had for six years carried a pistol-ball in his brain. He died from bleeding of a wound which divided the radial artery. The bullet entered over the right eye. It could not be felt by cautious probing. No pain, unconsciousness, or other bad symptom followed; and the boy was at work in a few days with the wound healed. The ball was found "imbedded in healthy brain, surrounded by a very small quantity of slightly yellow fluid," and "covered (but not enveloped) by a small portion of dura mater." Exact location of the missile is not stated. The patient had been under the reporter's observation during the whole six years and had never shown any cerebral symptoms. What adds to the curiosity of the case is the fact that the youth rode three miles on horseback to the doctor's office, within twelve hours after the shooting.

Dr. Love, of Atlanta, believes that very important knowledge of the condition of the circulation, digestion, and secretions can be gained by habitual observation of the palate, especially its soft portion. Particularly certain, as an early indication of a "bilious" condition, is a yellow tinge in these parts. It is claimed, too, that the eruption of measles, scarlatina, or variola, becomes visible here twelve or twenty-four hours earlier than elsewhere.

Dr. Leitner warmly recommends tarred strips of cloth in place of common adhesive strips, and rollers smeared with the same substance, as a surgical dressing. Once applied it rarely needs to be interfered with. It protects perfectly from flies, and, the writer claims, from erysipelas and gangrene.

Several other papers complete this unusually good collection. It is a pleasure to notice, moreover, its neat and tasteful garb, and the almost entire absence of typographical errors.

2. In the pamphlet containing the *Transactions of the Mississippi Society*, we learn from Dr. Wirt Johnson that salicylic acid has come into extensive and successful use in that State. As an antiseptic dressing in surgery, he prizes it very highly. Besides its virtues in rheumatic cases, he regards it as extremely useful in diphtheria. Simple inflammatory sore-throat he has found very amenable to the local application of a weak solution.

Dr. Whitehead claims exceptional success with diphtheria, from small, alterative doses of calomel combined with bicarbonate of soda, together with quinia and iron.

Dr. Powell believes that constitutional syphilis is a milder disease in the African than it is in the white man. There is, he claims, much more of a tendency to a spontaneous disappearance of the taint from the system. The disease is more amenable to treatment, and the cures more complete and lasting. He even states that "syphilis imparted from the white to the negro, being modified, becomes syphiloid, producing chancreoid, rarely followed by secondary and tertiary symptoms." The writer elsewhere mentions, however, the frequency of syphilis as cause of abortion, premature labour, and infantile disease; adding that "by far the greater number" of such infants die—mostly before the age of two years. We should much like to learn what foundation there really is for this assumed difference between two races.

Dr. Phares notes the frequency with which immediate relief to agonizing colic is obtained by the "knee-breast" posture, or by hanging the entire trunk and head over the bedside, or even, in extreme cases, suspending the entire person by the ankles.

Dr. E. W. Hughes describes a terrible epidemic of cerebro-spinal meningitis, which prevailed among negroes employed upon the fortifications constructed around Grenada, in the fall and winter of 1862 and 1863. Usually without warning, the patients were seized with chill, intense headache, with pain and stiffness at back of neck, followed by irregularly intermittent fever, vertigo, intolerance of light, sound, and touch. Delirium and coma were common, with variable affection of the pupils, deafness, irregular and oppressed breathing and many other symptoms of profound poisoning of the nervous centres. Pain in head and neck, retraction of the head, and stiffness of the muscles of the posterior cervical region, were the pathognomonic symptoms. No cutaneous eruption was observed, except herpes. [Would not the colour of the skin mask the characteristic blotches?] The weather was wet and very variable in temperature. The men worked hard, often in mud and water and exposed to rain and sleet. The quarters were poor and crowded; the food poor; and the spirit that of discontent, depression, and home-sickness.

The malady being deemed one of depressed vitality, quinia, opium, iron and stimulants were given; but all the patients died. Autopsies revealed intense congestion of the membranes and sinuses of the brain. The pia mater was opaque, thickened, adherent to the brain, and its vessels gorged. Exudation, from turbid serum to viscid pus, was found between it and the arachnoid, especially at the base. The meninges of the cord were similarly affected. Antiphlogistic treatment was then tried—venesection, cups, and cold applications, with full doses of calomel and Dover's powder. From this change of treatment, it is claimed that about one-half the cases were saved. Success depended on the promptness of the first measures; no hope was felt unless the cases were seen early. The mortality of the epidemic was estimated at about one hundred—all young, stout men.

Among a number of surgical cases collected by Dr. Hall we find two of bullet-wounds in head, with escape of brain-substance, very little shock, and scarce any serious symptoms. Both were youthful soldiers in the Confederate army, and both

were living in good health at time of this report. In one case it is explicitly stated that the ball remains in the brain, while in the other the same is inferred, though not distinctly asserted.

A singular case is narrated by Dr. Hart, where the stomach was partially extruded through a knife-wound between the eighth and ninth ribs. The organ being somewhat distended, all attempts to return it through the cut failed, even after enlarging the latter, until at last the stomach itself was opened, emptied, and closed up again by interrupted suture, when it was returned to its proper location. Fourteen days later, the patient, a field-hand, resumed his work, and "lived happy ever after."

3. The current publication of the *Iowa Society* is chiefly noteworthy for some very sensible advice and suggestion in the President's address, by Dr. Bulis. Of the two days occupied by each session of the Society, one is taken up with routine business. To fill up the remaining time there are often offered as many as fifty papers. Of course, but few of these can be read; but in the attempt to present as many as possible these few are hurried over with no time for question, debate, and comparison of views. Fewer contributions, more deliberately considered, would be more profitable to the listeners and more encouraging to the authors.

The present publication, while containing many articles which were doubtless of use in refreshing the memories and attracting the attention of those who listened to them, has little that calls for our special notice.

We observe in a notice of an epidemic of cerebro-spinal meningitis, by Dr. William Watson, that the frequent presence of herpes labialis, and the general absence of any more characteristic eruption, are adverted too—agreeing somewhat with the cases described in the Mississippi transactions. Here, as in the other epidemic, the onset of the disease was most startling in its sudden severity. The verdict as to treatment is different; tonics, anodynes, stimulants, and counter-irritation were found more useful than depressants.

4. We find in the *Vermont Transactions* a plain, unstudied but most graphic picture of diphtheria, as observed by Dr. Calderwood, in a rural district in Northern Vermont. That such a practice should have included fifty-five cases of this disease in nine months, is one of many indications of the recent alarming prevalence of this malady in New England. [See notice of *Report of Massachusetts Board of Health*.] Cold, wet lands have seemed to afford the most favourable conditions for its existence. A preceding summer's drought, with ensuing low water in the wells and springs, have been noticed in connection with epidemic prevalence. In one family two fatal cases originated during extreme lowness of the water in the well, and while the water looked milky, and was refused by the cow, that would suffer thirst for days before she would drink it. The cases began two days apart, and both died the same day. Two cousins, who came to visit the sick ones, were stricken down ten days after, and died within a week. All but two of the cases (*i. e.*, 53) occurred in a space of four miles along a river, and within one and a half miles of its banks. Eleven deaths took place. The country was hilly, but cold and wet from the nature of the soil. Out of fifty cases tested, albuminous urine was found in forty-five. No *special* treatment is commended. Quinia and iron, with carbolic acid solutions or tincture of iron locally, were principally trusted.

Dr. Bullard, of St. Johnsbury, describes a form of continued fever, prevalent in his neighbourhood, which certainly seems different from the typhoid. It begins

much like the latter, but runs a longer course, has no tympanites nor abdominal tenderness. Constant vomiting, with progressive emaciation and exhaustion are the prominent symptoms. A typical case, here described, died after sixty days illness. A little softening and congestion of the mucous membrane in the stomach and duodenum, were about the only traces of disease disclosed by the autopsy, excepting frightful emaciation. This form of fever had never prevailed thereabouts till within three years past. Recovery, beginning in four to six weeks, is very slow, with long-continued trouble in taking food, and persistent pains in the muscles, especially of the limbs. The debilitated and overworked adults, especially exhausted women, are the subjects; very rarely children. The cases known to the reporter number 17 men and 64 women; deaths, 5 and 24 respectively. There is never discovered any affection of the intestinal glands or indeed any other very marked inflammatory lesion. The only symptom noted as pathognomonic is a peculiar breath—likened by some to the odour of garlic, and by others to that of valerianic acid. This is always present. The name generally given the malady is gastric fever.

Dr. S. S. Clark, in an "open letter," administers to a well-known Washington clergyman a scathing and merited rebuke, for puffing a quack remedy, in a "religious" weekly of large circulation. Truly, the astonishing gullibility of the reverend clergy, and the often equally amazing assumption to give confident judgment on matters wholly without their sphere, is equally strange and deplorable. The simple testimonials of illiterate and guileless shepherds dwelling in remote rural districts, successively given to almost every advertising quack of the century, are bad enough, but such recklessness—to give it no harder name—as is here rebuked, in a man presumptively not wholly destitute of knowledge of the world, as well as of books, is simply unpardonable, save on confession and repentance.

5. In the minutes of the *Rhode Island Society*, we find that Dr. W. W. Potter reported a case of undoubted hydrophobia, which was attributed to a bite received three years previously. Death occurred after three days' illness. The evidence is not here stated.

Of eleven cases of *placenta prævia*, seen by Dr. Capron, eight only were in his own eight thousand deliveries. Version and delivery at the earliest possible moment, is his rule of conduct. Tampons and cold applications are used only until the os is enough dilated to warrant immediate action. One of his eight cases died from the results of the misplaced organ, and another from some other cause. Of the consultation cases, two died.

As all over New England diphtheria attracts much attention from the profession in Rhode Island. Two papers here treat of it, and its sequels. Dr. James H. Eldredge, one of the best known and most respected physicians in the State, notes 81 deaths in two rural townships from 1861 to 1876. Of these, 66 were children less than six years old. The disease could at no time be called epidemic. The cases appeared in detached groups, by families or neighbourhoods. In 1877, however, there were reported no less than 47 fatal cases, in the same limits. This mortality exceeded that of any other one disease. Thirty-five were under six years of age. Dr. Eldredge agrees with Dr. Calderwood, of Vermont, as to the general principles of treatment, the usual percentage of deaths to cases, and as to the original systemic character of the affection. In periods of epidemic prevalence, the later cases are less fatal than the early ones. Dr. Eldredge is confident that before diphtheria was generally recognized in this country, cases were frequently diagnosticated as scarlet fever without eruption.

6. We are pleased to learn, from the *Connecticut Transactions*, that the legislature of that State has granted the petition of the Medical Society by establishing a Board of Health. Three of its six members are to be physicians. All are appointed by the Governor.

From the responses made to certain questions sent to physicians throughout the State, we find there is a prevailing belief in the recent and continuing increased frequency of malarial diseases, with diminution of typical typhoid fever. Several reporters believe that a hybrid fever, for which they accept the name of typhomalarial, is progressively supplanting or replacing the old-fashioned typhoid. As in New England generally, too, diphtheria has of late been occupying a very high position as a cause of death.

Some interesting cases are reported by Dr. Storrs in support of the position that typhoid fever may arise spontaneously. The local causes here believed to have been efficient, were decaying vegetables in the cellar, gases from a kitchen drain, a well polluted by kitchen slops, and emanations from a sewer draining off both slops and excrement, which had become obstructed and hence discharged bad air into the house.

As to the possibility of a spontaneous origin for diphtheria and scarlet fever, the difficulties of the subject naturally prevent many very confident replies. Some gentlemen, however, feel certain that they have observed cases where communication of infection from without was impossible.

Dr. Coates reports a case of extra-uterine pregnancy, in which gastrotomy was successfully performed for the removal of the remains of the child, a year after the imperfect labour. He thinks the occurrence of misplaced fetal development is much more common than is generally known—cases often failing to be recognized. He has been informed that the encysted remains of such accidents have been found in a fat ewe and in a sow, upon the slaughtering of these for food. No history of symptoms was learned in these cases.

Dr. Jewett reports a case of "concussion of the brain and spinal cord" following a railroad accident. Excessive stammering was a prominent symptom. Weakness of the lower extremities and general debility persisted at date of report, two or three years after the accident. Gradual improvement, however, still continued. He had not formerly stammered. As he got better this difficulty disappeared, except when excited.

Pure carbolic acid applied to boils and felons works like a charm in causing resolution, according to Dr. B. F. Harrison. Success attended it even in cases where suppuration had apparently begun, in felons that had kept patients awake for nights.

Dr. Wainwright reports cure of popliteal aneurism by two hours' compression of the femoral artery, by means of a "horse-shoe tourniquet," under chloroform. No ill effects followed.

A remarkable instance of the transportation of clots through the great blood-vessels is reported by Dr. I. W. Lyon. A consumptive patient had an attack of thrombosis in the left popliteal and femoral veins. A few days later the corded swelling and tenderness had nearly disappeared. Paroxysms of dyspnœa soon appeared, in one of which he died. In addition to the usual signs of chronic phthisis, perforation of the pleura was discovered. The venæ cavæ and right heart were moderately filled with dark clotted blood; in addition, the auricle contained a thick, fleshy coagulum, nearly white, about two inches long, and the inferior cava a long and slender clot of similar colour and consistence. The pulmonary artery contained a mass resembling a cluster of "angle-worms"; a slender, white, fibrinous clot coiled on itself, mixed with dark, jelly-like coagula, filling the calibre of the vessel and lying close up to its bifurcation, about an inch or

inch and a half from the valves. The unavoidable inference, after a careful examination by a skilful pathologist, was that this branching coagulum had been formed in the veins of the lower extremity during the inflammatory attack, and thence carried by the current to the heart and the pulmonary artery.

B. L. R.

ART. XXVIII.—*Report on Heating and Ventilation, prepared for the Trustees of the Johns Hopkins Hospital, Baltimore.* By JOHN S. BILLINGS, Surgeon U. S. A. 8vo., pp. 93. Baltimore, 1878.

THAT some artificial force is required to ventilate a hospital effectually, may now be regarded as a settled thing. At any rate, if any one now believes that this purpose may be trusted to the unassisted powers of nature, he may as well be left to the enjoyment of his opinion unmolested by argument or evidence. But something more than a recognition of the principle is necessary to practical success. It is not enough to put in fans and steam coils, air shafts, and chimneys, to make openings for the fresh air to come in, and other openings for the foul air to go out. And yet, up to a very recent period, this seems to have been regarded in this country as embracing all the requirements of complete hospital ventilation. It has been learned, at last, that the various arrangements concerned in effecting the interchange of air must be prepared under a system of exact relations to one another. Given the quantity of air to be introduced, we have then to calculate, for instance, the size and velocity of the fan, the size of the shaft through which the air is driven to the heated surfaces, the capacity of the registers by which it is admitted into the ward, as well as the openings by which it escapes. These relations must all be ascertained under the application of a few simple rules of arithmetic and mechanics, and the results verified in practice by means of instruments contrived for the purpose. When these various appliances are constructed at haphazard, as they often are, we have no right to charge the imperfect result that often follows upon the system itself. And when all is done, there is need of continued intelligent observation of the working of the system under the varying conditions of the atmosphere, such as its warmth and moisture, the force and direction of the winds. Much of Dr. Billings's report is occupied with this latter branch of the subject, for it embraces tables of observations pursued several months together in the Barnes Hospital connected with the Soldiers' Home at Washington, recording the inflow and outflow of the air, its moisture and warmth, the force and direction of the wind, the height of the mercury in the barometer, etc., and also a similar, though not so extensive, series of observations made at the Boston City Hospital, the former by Surgeon D. L. Huntingdon, U. S. A., the latter by Dr. Cowles, the superintendent. Dr. Billings justly regards these as "the best collection of such observations ever made in this country," and although too few to be made the basis of any fixed rules of arrangement or practice, yet, as he says, "if we only had a year's careful observations from the Massachusetts General Hospital; the Presbyterian, Roosevelt, and New York Hospitals, of New York; the Presbyterian, Episcopal, and University Hospitals, of Philadelphia; the Cincinnati Hospital, and the Cooke County Hospital, of Chicago, similar in character to those above given, we should have the data for a treatise on hospital heating and ventilation that would be really valuable and useful."

The rest of the Doctor's report is occupied with some of the details of the heating and ventilating arrangements which he designs for the Johns Hopkins

Hospital, and some desultory remarks on the general subject, all which, as being the results of long and intelligent study, are well worthy of careful consideration. A perfect system of ventilation adapted to meet all exigencies should embrace, he thinks, both fans and heated aspirating chimney flues. If we are to have but one, we say, let it be the fan, but it would also be well to utilize the heated chimneys which, for one purpose or another, are always to be found in hospitals.

As a means of warming, Dr. Billings prefers hot water to steam, but we doubt that the few advantages attributed to it offset the many possessed by steam, two of which seem to be conclusive. In all hospitals steam is used for the kitchen, the laundry, and other purposes, and certainly it must be an additional expense to establish and maintain in connection with it large arrangements for heating water. As a mode of heating hospitals, steam is preferable also on the score of its greater flexibility. There are many days in the year, in early spring and autumn, when a little artificial heat thrown into the halls, towards evening and on damp mornings, is very grateful to the patients. With steam always on hand, this may be speedily done, while with water alone, it must be the work of hours; and open fires in the wards only partially answer the purpose, desirable as they are as a part of the warming system.

The report also embraces two reports respecting the quantity of carbonic acid in the air of hospital wards, one from Assistant Surgeon Mews, and the other from Professor Edward S. Wood. Their analyses prove little more than the fact that with not more than 6 parts of carbonic acid in 10,000, the air may be regarded as tolerably pure. It is to be hoped that this inquiry will be prosecuted further, because it is intimately connected with the question of the proper height of the ceilings. If, other things being equal, the purity of the air can be as well maintained in wards twelve feet high, as in wards much higher, then we are deprived of a prominent argument in favour of one-story wards with a roof twenty-five or thirty feet above the floor. And surely if the air can be completely renewed twice as often in one ward as it can in another whose cubical contents are twice as large, the chance for the lodgment of disease germs is lessened in the same proportion. Nothing but unquestionable sanitary advantages can warrant a mode of hospital construction so much more costly in the outset, and in which the warming and the ordinary service must necessarily be more expensive. The Trustees of the Johns Hopkins Hospital can scarcely do the community a greater service than to build it at the smallest possible cost consistent with the attainment of every desirable object. In this time of distrust and dissatisfaction about the proper cost of hospitals, such a performance would prove an incalculable help to the cause of humanity. We trust that their conceptions of the work they have undertaken will be realized, not only in making a noble provision for the sick and suffering of their own community, but also in furnishing a salutary example and lesson to other communities when ready to engage in similar work. I. R.

ART. XXIX.—*The Pathology of Pulmonary Consumption*. Three Lectures, by T. HENRY GREEN, M.D., F.R.C.P., Physician to Charing-Cross Hospital, and Assistant Physician to the Hospital for Consumption and Diseases of the Chest, Brompton. 12mo., pp. viii., 103. London: Henry Renshaw, 1878.

THE part which inflammation plays in the production of phthisis and tuberculosis continues to be, in spite of all that has been written on the subject during the last score of years, one of the vexed questions of the day. The experience

of many, if not the majority of good observers, both at the bedside and with the microscope, has led them to the conclusion that most of the lesions of the conditions classed under these heads are distinctly traceable to inflammatory processes. But there are still a large number of pathologists, including such distinguished investigators as Reindfleisch and Wilson Fox, who hold that the disintegrative consolidation of the lungs in phthisis is almost invariably associated with the development of a specific small-celled growth in the alveolar walls, which they regard as tubercular, and that inflammation is to be regarded, when unmistakably present, as, at most, an accidental concomitant.

Dr. Green, in the Lectures before us, endeavours to show that the former is the correct view of the pathology of phthisis, and also of acute miliary tuberculosis; for between these two conditions he can detect no true histological difference. It would be impossible, within the limits of a notice of this kind, to give in detail the various steps in the arguments by which he supports the position he has taken. We must, therefore, content ourselves with calling attention to a few of its leading features.

If the lungs, in the various forms of pulmonary phthisis, be examined microscopically, it will be found, Dr. Green says, that the histological changes which have taken place in them are mainly of four kinds: 1, the presence within the pulmonary alveoli of a fibrous exudation and leucocytes; 2, an accumulation of large epithelial cells within the alveoli; 3, an infiltration and thickening of the alveolar walls with small cells, together with, in most cases, a similar change in the walls of the terminal bronchioles; and, 4, an increase in the interlobular connective tissues. These four kinds of morbid change are very constantly associated, although in very different degrees, and some are more prominent and characteristic than others. Upon the preponderance of one or other of these mainly depend those variations in the physical characters of the lungs which are met with in the different stages, and in the different varieties of the disease.

In those forms of phthisis in which the process is of maximum intensity, the consolidation of the lung being the most rapidly induced, exudation and emigration may occupy a prominent place. In cases of somewhat less intensity, epithelial proliferation, accompanied by more marked changes in the alveolar walls, will take a large share in the production of the consolidation, whilst in those cases in which the inflammatory process is least intense and most chronic, the growth in the alveolar walls and interlobular tissue will constitute the predominant lesions.

The author then proceeds to show that all the above-named changes occur in morbid conditions of the lungs which do not come within the category of phthisis, and the pathology of which is comparatively well understood. For instance, the exudation products, which, although less frequently met with than the other forms of lesion, often constitute, in his opinion, an important element in the disease, are indistinguishable from those that are found filling the alveoli in ordinary acute croupous pneumonia. Again, the proliferation and accumulation of epithelial cells within the pulmonary alveoli, which he describes as occurring in phthisis, are also observed in catarrhal pneumonia. A certain amount of epithelial proliferation also frequently takes place in croupous pneumonia, and especially in the secondary pneumonias, which are often met with as the acute process terminating a chronic disease. The cellular infiltration of the alveolar walls, although less frequently met with in non-phthisical and non-tubercular forms of pulmonary disease than the other changes occurring in phthisis, and, therefore, most characteristic of this condition, is occasionally seen in, 1st, cases of ordinary pneumonia, in which the exudation products are not readily absorbed, and in which the condition becomes more or less chronic; 2d, those conditions of the lungs, of which

Corrigan's cirrhosis may be taken as the type; and, 3d, many cases of long-continued bronchial catarrh. Virchow, also, long ago pointed out the richly cellular character of the products of scrofulous inflammations, the tendency to cellular infiltration of the tissues, and the extreme tardiness with which the infiltration becomes absorbed. It need scarcely be added that an increase in the interlobular connective tissue occurs in all conditions of long-continued pulmonary irritation, and that it reaches its maximum in Corrigan's cirrhosis.

The giant-cells, which are regarded by many observers as a characteristic microscopical appearance in phthisis and tuberculosis, are identical, in the author's opinion, with the large cells found in scrofulous inflammation, and are to be looked upon as "the result of an inflammatory process of slight intensity, occurring in tissues of such low vitality that the cellular inflammatory products are incapable of forming an organized tissue, but merely undergo some increase in size, and then tend to slowly degenerate. The protoplasm grows, the nuclei multiply, but that higher manifestation of vitality, the division of the cell, does not take place."

We have already alluded to the fact that Dr. Green teaches that the changes in the lungs in pulmonary phthisis are similar, histologically, to those which occur in acute miliary tuberculosis. They differ, however, he says, in two particulars. In the first place, whereas the lesions in acute tuberculosis, owing to the infective character of the disease—for he adopts Buhl's view of its pathology—tend to be limited to small, circumscribed areas; those of phthisis more commonly involve wider and more diffused tracts of tissue. Secondly, inasmuch as phthisis usually runs a much more protracted course than acute tuberculosis, the lesions not only become more densely fibroid, but they are also frequently the seat of secondary changes.

These Lectures are well written; the illustrations are well executed; and to us Dr. Green's reasoning seems convincing. J. H. H.

ART. XXX.—*Die Entstehung der Gefahr in Krankheitsverlaufe, mit Besonderer Berücksichtigung der Diagnose der Gefahr, ihrer Prophylaxe, und Therapie.* Von Dr. L. M. POLITZER, A. O. Professor, Director der Ersten Öffentlichen Kinderkrankeninstitutes in Wien. 8vo., pp. xx., 395. Wien: Wilhelm Braumüller, 1878.

The Occurrence of Danger in the Course of Disease, with Special Reference to the Recognition of the Danger, its Prophylaxis, and Therapeutics. By L. M. POLITZER, Director of the Children's Hospital in Vienna, etc.

MUCH of our want of success in the treatment of disease is due, Dr. Politzer believes, to an insufficient appreciation in the course of disease of symptoms which indicate the beginning of danger. While the teacher at the bedside and writers of systematic treatises on disease take great pains to train the student in the art of diagnosis, but little attention is paid, he thinks, to prognosis. And yet it is evident that, unless we are able at once to recognize the approach of danger even though afar off, we shall not only often fail in our efforts to bring the disease to a favourable termination, but may often find a patient in a collapse whom a few hours before we had left apparently doing well. The subject is indeed an important one, but we can scarcely agree with our author in thinking it wholly neglected. Certainly in this country the majority of intelligent practitioners are keenly alive to the dangers which the author refers to, and we know

that it is quite common for clinical lecturers to point out the necessity of being constantly on the lookout for accidents and complications in the course of disease.

Among the signs of danger none are of greater importance than those which indicate the presence of commencing paralysis of the heart and of the respiratory centre in the medulla oblongata, and when these are observed—no matter how little marked they may be—they should be at once met with appropriate treatment. Nothing is more likely to produce paralysis of the heart and of the respiratory centre than long-continued fever; and although the author fully recognizes the fact that high temperature does not alone constitute fever, and that all the lesions of fever are not due to it solely, he is nevertheless fully convinced of the necessity of moderating it whenever this is possible. He therefore raises his voice against a purely expectant plan of treatment in fevers, by which, in his opinion, many lives have been sacrificed, and urges upon us the use of the cold bath, by means of which we have it in our power generally to convert a high degree of fever into a low one. All the good effects of the cold bath are not, however, to be referred to its powerful influence in reducing the temperature of the body. By its sudden action on the cutaneous nerves, the central organs of innervation are aroused from their torpor. In this way the author explains the improvement in the mental condition of a fever patient, which often immediately follows his immersion in a cold bath, or before any considerable reduction in his temperature can have taken place. He recommends, however, the use of the cold bath not merely in long-continued fevers with high temperatures, but in the beginning of the treatment of scarlatina maligna and of other diseases of this class. It may also be used with advantage in the management of so simple a disease as tonsillitis, in which we shall often by its use prevent the occurrence of the prostration which often succeeds to this condition, and which can only be attributed to the high fever which generally accompanies it.

The special dangers which occur in the course of chronic diseases are also carefully pointed out by the author, and so are the means by which the physician is to avoid them. As these are to be found in every text-book, it seems unnecessary to call special attention to them here.

J. H. H.

ART. XXXI.—*Congenital Occlusion and Dilatation of Lymph Channels.*

By SAMUEL C. BUSEY, M.D., Professor of Theory and Practice of Medicine in University of Georgetown, etc. 8vo., pp. xvi., 187. New York: Wm. Wood & Co., 1878.

How great a fire a little matter kindleth is well seen in this book. The author had under his care a single case with which the volume opens; became interested in studying the subject, ransacked the literature of all nations, and has gathered together eighty-seven other cases, given usually with some fulness, and illustrated by fifty-six engravings. In his preface he acknowledges fittingly his obligations to Dr. Billings and the National Medical Library. Indeed such a book could not have been written before the existence of this library and the extraordinarily useful and elaborate subject-catalogue prepared in connection with it.

The book consists practically of a series of articles contributed to the *American Journal of Obstetrics*, and is supplemented by a similar series, published in the *New Orleans Medical and Surgical Journal*, on the acquired varieties of the disease. The two constitute a valuable contribution to an obscure subject, involving an immense amount of research, “while never neglecting a busy practice, and

for the most part during the hours usually appropriated to recreation and sleep"—an example of industry and zeal for many a young doctor not overburdened with patients, if not to the traditional "busy practitioner."

To analyze the book would be largely to reproduce it, and we must refer those interested in the subject to the text itself. It consists essentially of the narration of the collected cases grouped together clinically, and followed by a running commentary. At the end are placed some "General Remarks" and a section on "Treatment." This, whether constitutional or local, medical or surgical, is naturally unsatisfactory, for the disease is but little amenable to treatment other than amputation—where this is practicable.

The book has one serious defect as it seems to us. With such a mass of material the subject might have been treated systematically, giving its pathology, etiology, description, diagnosis, prognosis, and treatment under appropriate headings, using such typical cases as might be selected, and grouping the remaining cases, to which reference could be made, at the end. Students of the subject would thus have been able to obtain succinctly a more accurate idea of the disease. As the book is arranged it is essential to read it all, and moreover one will rise from its reading without such crystallized and sharply-cut notions as an author who has carefully studied the subject can readily formulate in well-chosen words. The author pleads in excuse that he has desired to present the subject clinically. But after all a book is intended to impart useful information, and we think the end would have been better attained had the book been recast in the form we have suggested.

W. W. K

ART. XXXII.—*The Antidotal Treatment of Disease.* By JOHN PARKIN, M.D., Corresponding Fellow of the Royal Academies of Medicine and Surgery of Madrid, of Barcelona, and of Cadiz; F.R.C.P. Edinburgh, etc. Part I. 8vo., pp. 307. London: Hardwicke and Boyne, 1878.

IF it be obvious that all criticism of books involves a twofold duty, towards authors and towards those who read, it will appear also that the principle of the greatest good to the greatest number makes paramount the reviewer's duty towards readers. Granting this, three kinds or classes of books may be named, which will include all: first, those which every one *must* read, if he would not fall entirely behind his times; secondly, those which any one *may* read, who has abundant leisure, and special interest in its subject; and thirdly, those which no one ought to waste time upon under any circumstances.

We believe it not unjust to Dr. Parkin's book to place it in the second of these categories. It gives evidence of considerable research in regard to the history of medical systems and theories; and a commendable acquaintance with recent pathological and therapeutical investigations. The characteristic matter of the book, however, consists in three ideas or opinions of the author, with a number of clinical facts interpreted by him as supporting them. The first of these opinions is, that "the majority of fevers—all specific or essential fevers—are the product of one particular agent, viz., *malaria*." In this identity of causation Dr. Parkin includes intermittent and remittent fever, yellow fever, typhus, (probably) typhoid, puerperal fever, smallpox, scarlet fever, and measles; repudiating the "theory of contagion" altogether (p. 298).

His second peculiarity lies in the pathological domain. He holds that the *symptoms* of all fevers are due to the presence of the malarial poison in the *capillaries*,

systemic and pulmonary; its action being "due, solely and entirely, to the toxic effect of the morbid matter on the nervous system" (p. 103).

Lastly, that which justifies the title of the book, "The Antidotal Treatment of Fever," is the assertion, that *carbonic acid*, given especially during the cold stage, is *the antidote* for all forms of fever. The manner in which Dr. Parkin adduces facts to support this view, not only from his own experimental medication in practice, but from that of others, and from familiar medical records, is that of an earnest as well as ingenious advocate. Effervescing draughts, commonly regarded as agreeable palliative, minor remedies, are by our author promoted to the rank of therapeutic agents in chief; heroic, though so gentle; "suaviter in modo, fortiter in re." All other agencies in therapeutics are, with him, to be extinguished by this gas. Champagne must now be understood to do good in yellow fever and typhus, not through its alcoholic constituent, but by its effervescence. Quinia Dr. Parkin believes to be too uncertain, and often injurious, to be given longer in intermittent; carbonic acid must take its place.

These are assertions not only of opinion, but also concerning clinical facts. Only by clinical experience, carefully and largely tested, can they be proved or disproved. If we share with many, probably most of our readers, very strong doubts as to the exactness of Dr. Parkin's interpretations, and the soundness of his practical conclusions, his appeal has been made to experience; and that appeal must, of course, be sustained.

H. H.

ART. XXXIII.—*Physics of the Infectious Diseases. Comprehending a Discussion of Certain Physical Phenomena in Connection with the Acute Infectious Diseases.* By C. A. LOGAN, A.M., M.D. 12mo. pp. 212. Chicago: Jansen, McClurg & Co., 1878.

A LONG residence on the western coast of South America has led Dr. Logan to notice certain remarkable facts as to the non-existence of some infectious diseases, and the modification of others, in large portions of that volcanic belt of land.

The old theory, that earthquakes and volcanic eruptions are mere mechanical activities of the boiling and bubbling molten matter under the earth's crust, is entirely discarded by Dr. Logan. Electric disturbance, or rather perhaps the restoring of electric equilibrium, is believed to be the cause of the phenomena in question. Regular thunder-storms are rare in the earthquake region. Preceding the convulsions, displays of electric lights in the heavens are quite common. The magnetic needle is affected, and the hair of animals is charged with electricity. Peculiar oppression, or other strange sensations of the nervous system, are noticed. A peculiar state of the atmosphere is often remarked. Meteorites are frequently unusually abundant. The production of rain and of ozone also point to electric action as the essence of the phenomena.

Having briefly noted some of the peculiarities of the region, as stated and interpreted by our writer, we will now pass to the special characteristics of disease as there existent.

Whatever may be thought of Dr. Logan's reasoning, his statements as to the absence or modification of epidemic diseases on the west coast of South America are sufficiently startling to secure attention and elicit thought. The value of facts is not destroyed by any lack of skill in their interpretation.

Throughout the rainless regions, and those where the waterfall is purely sea-

sonal—subject, as we have seen, to frequent earthquakes—a large number of those infectious diseases which devastate other countries are practically unknown. And our author adds, with less positiveness, that where a rainy season exists such diseases prevail, if at all, especially during that season, when the shocks have ceased for the year.

The absence of these general scourges of mankind from large portions of the western coast of South America is not due to lack of facilities for importing the infectious principles. Commercial intercourse with the world at large, and even with neighbouring countries afflicted with cholera and with yellow fever, is constant and wholly unrestricted. Nor is lack of humidity the cause of this exemption. Not only are some of the favoured regions well watered by mountain streams, but they are also recipients of moisture from the sea, and the seat of extremely heavy dews. Mildew and rust are common annoyances where rain is unknown. Indeed there are some places possessing copious seasonal rains which share with the rainless districts an exemption from the zymoties. The one particular in which all agree is the existence of constant shocks and eruptions—regarded by Dr. Logan as manifestations of intense electric disturbance.

Cholera and yellow fever are reported to be wholly absent from the southern three-fourths of the western slope; and of very doubtful existence near the equator. Scarletina has been reported to have occurred in certain localities; but it has acquired no foothold whatever in any part of this extended but narrow strip. Neither of the great continued fevers, typhus or typhoid, is known at all. Diphtheria and “hay-fever” are equally absent. Cerebro-spinal meningitis and relapsing fever may possibly have appeared to a very limited extent.

Variola is stated to become so changed by local influences as to almost lose its identity. Among the filth and wretchedness of the poor in the Chilian cities it constantly abides, and at intervals acquires the character of an epidemic. It then proves terribly fatal; but never leaves the cities, nor, indeed, does it often extend outside of the lowest slums in which it arises. The disease differs here from that of other lands in several points; but the most important are the inefficacy of vaccination, and the liability to attack the same patient repeatedly. All possible means have been tried to secure the best lymph, surrounded by all possible precautions against deterioration; but no protective influence follows its use. We are not informed as to the course of the vaccination wound. The change of type here noted is said to obtain in Peru as well as Chili.

Syphilis prevails to a fearful extent. Erysipelas becomes epidemic at times, assuming hemorrhagic and gangrenous forms, and causing great mortality. In puerperal women it takes the shape of metro-peritonitis. Dysentery is common, especially among the poor. Influenza has not unfrequently appeared as an epidemic, almost simultaneously at distant points.

One malady is noticed as peculiar to Chili—the chabalonga. This at times becomes epidemic, especially among the lowest classes, visiting the better classes mildly if at all. It seems to be a product of filth and wretchedness. There is no eruption. The name comes from a characteristic sequel—the falling of the hair. Some physicians have regarded it as identical with typhus, as that appeared among the Irish peasantry.

A peculiar fever, with warty eruptions, appeared in Peru among labourers engaged in building a railroad through soil never before disturbed by man, among the Andes. Some claim that it has previously appeared under similar conditions. The tubercles are from the size of a pea nearly to that of a hen's egg. They tend to bleed profusely. Stimulants and tonics were employed; but neither in this affection nor in the chabalonga did quinia exhibit specific powers.

We ought perhaps to have earlier drawn attention to the remarkable fact, that

the large cities of this coast, so wonderfully free from the maladies which ordinarily bear with especial severity upon the crowded masses of the poor, are abominably deficient in the sanitary conditions generally thought essential to secure reasonable freedom from fatal epidemics. In most cases the lower classes are ignorant, shiftless, and vicious, and living in the most deplorable extremes of bad diet, bad drainage, and unwholesome surroundings. The character and course of the diseases which *do* prevail, indicate the constitutional weakness and depression of vitality that might be expected under such circumstances. Some especial cause, therefore, must exist for the absence of the infectious diseases of other regions. This Dr. Logan is disposed to find in the peculiar electric or magnetic conditions of the locality—of which the startling mechanical phenomena of the coast are the token and expression. The effect of electricity on chemical and vital action is referred to at considerable length. The author's line of thought may be suggested by one of his illustrations; if chemical change in fresh, pure milk is almost instantly brought about by a thunder-storm, why may not the formation of toxic compounds, or the development of certain organic germs, be equally as strictly dependent on electric conditions? Accordingly, he believes that electric energy may and does decompose "the infectious molecule," by rearrangement of atoms or their dispersal. That action of ozone, which we designate as antiseptic or disinfectant, is probably as yet but partially appreciated. And a free evolution of this agent is known to *attend* telluric convulsions, as it undoubtedly does forms of electric activity. A peculiar odour, pretty certainly that of ozone, has in all times and countries been observed in connection with earthquake shocks, and with the so-called "stroke of lightning."

In respect as it describes the diseases peculiar to a region but little known to the European and American profession, the modifications of smallpox there observed, and the extraordinary exemption from several of the most destructive of the acute infectious diseases prevailing elsewhere—this book possesses great interest for all. As to the peculiar speculations of the writer there may be room for a diversity of opinion; but even those who may be unable wholly to follow him, cannot fail to recognize the value of his suggestions as food for thought, and as providing possibly the seeds for harvests in the future.

B. L. R.

ART. XXXIV.—*Atlas of Skin Diseases*. By LOUIS A. DUHRING, M.D., Professor of Skin Diseases in the Hospital of the University of Pennsylvania; Physician to the Dispensary for Skin Diseases, Philadelphia, etc. Part IV. Philadelphia: J. B. Lippincott & Co., 1878.

THIS part appears with commendable promptness, and sustains in all respects the favourable opinion we have so recently expressed. The diseases illustrated are: Vitiligo, Alopecia areata, Tinea favosa, and Eczema (rubrum). The first three are somewhat rare affections, but their recognition by the practitioner is of importance, and will be rendered easier by the typical representations here given. The last picture, infantile acute eczema, shows one of the most common and vexatious diseases in all its characteristic diversity of efflorescence.

The artist has apparently so guarded his effects against exaggeration that the colouring in some portions of this latter plate and that of favus might be made considerably more brilliant in parts without surpassing nature.

The accompanying text preserves its previous high standard of simple excellence.

J. C. W.

ART. XXXV.—*Anatomy, Descriptive and Surgical.* By HENRY GRAY, F.R.S. *With an Introduction on General Anatomy and Development.* By T. HOLMES. A new American from the eighth English edition. To which is added *Landmarks, Medical and Surgical.* By LUTHER HOLDEN, F.R.C.S. Imperial 8vo. pp. 983. Philadelphia: H. C. Lea, 1878.

THE appearance of a new American edition of that well-known text-book, "Gray's Anatomy," is a matter of congratulation. Since the last reprint here, three new additions have appeared in England, in which the minuter anatomy of the ear and the kidney have been corrected, and the introductory chapter has been corrected and enlarged. Dr. Dunglison's exactness of revision and judicious selection of a few additional plates are also worthy of note.

But the most important difference between this and former editions is that Holden's book on "Landmarks" has been incorporated in the volume, making, in fact, two books in one, and this without any increase of the price. This is practically the anatomy that is most needed at the bedside, and cannot be too carefully studied and mastered by both the physician and the surgeon.

W. W. K.

ART. XXXVI.—*Abbreviations of Titles of Medical Periodicals to be used in the Subject-Catalogue of the Library of the Surgeon-General's Office.* Imperial 8vo. pp. vi., 96. Washington: Government Printing Office, 1878.

MORE than two years ago, we had the pleasant task of inviting our readers' attention to a "Specimen-Fasciculus" of the long-expected Subject-Catalogue of the National Medical Library at Washington, and the truth of the Hippocratic aphorism is now forcibly brought to our mind by finding that, though the *bien-nium* has slipped by, the manuscript of the Catalogue is still in "preparation."

The list of abbreviations, which is now before us, is designed, as we learn from Dr. Billings's prefatory remarks, partly as a means of obtaining criticisms and suggestions, and partly as a matter of convenience in preparing the Catalogue itself for the press. The principles observed in the adoption of the abbreviations have been (1) to follow the exact order of the words of the title; (2) to make the abbreviations as brief as was consistent with clearness; (3) to follow strictly the orthographical usages of each language; and (4) to attain uniformity, when possible without obscurity. We are glad to learn that the work of indexing Journals and Transactions deemed worthy of the labour has been completed, except as regards certain special branches of Medical Science, and that hence no delay from this source may be expected to hinder the early appearance of the much wished-for volumes.

As concerns the abbreviations adopted, such examination as we have been able to give leads us to believe that they are judiciously framed, and well adapted for their purpose; we have certainly neither criticisms nor suggestions for improvement to offer to the learned Librarian of the Surgeon-General's Office in this matter. We would venture to express a hope, and in this we are sure that we represent the feeling of all our readers, that our legislators in Congress may, during the coming session, think proper to make the needful appropriations for printing the Catalogue in the style which it merits, and thus confer an almost inestimable boon upon the Medical Profession, not only of our own but also of other countries, and thus indirectly, but not remotely, upon the whole community, and indeed upon the whole civilized world.

J. A., JR.

QUARTERLY SUMMARY

OF THE

IMPROVEMENTS AND DISCOVERIES

IN THE

MEDICAL SCIENCES.

ANATOMY AND PHYSIOLOGY.

On the Relative Size of the Trachea and Bronchia.

M. MARC SÉE gives the following results of his experiments, in a paper read before the Académie de Médecine:—

(1) The mean diameter of the trachea is generally larger in the male than in the female of the same age. It increases with age. It was $3\frac{1}{4}$ millimetres in a fœtus of seven months and a half. At birth it varies from 4 mm. to 5.6 mm. At the age of two years it is 7.5 mm. and even 8 mm. From four to seven years the diameters are from 8 mm. to 10.5 mm. Below the age of twenty the numbers vary between 16 mm. and 22.5 mm. in the male, in females between 13 mm. and 16 mm. The average in twenty-one adult male subjects was 18 mm., in twelve adult female subjects 14.5 mm.

(2) The mean diameter of the right bronchia in subjects under twenty years of age varies between 11.75 mm. and 17.5 mm. The average of eighteen male subjects was 14 mm., that of twelve females 12 mm.

(3) The mean diameter of the left bronchia varies in subjects over twenty years between 7 mm. and 13.5 mm. The average of eighteen male subjects was 11.6 mm., that of twelve female subjects 9 mm.

(4) The cube of the diameter of the trachea, as compared with the united cubes of the diameters of the bronchi, gave similar numbers in twenty-five cases. These cases comprehend: (a) Subjects to the number of thirteen, of either sex, above twenty years of age (with the exception of one boy aged four, who died of croup), in all of whom the size of the trachea surpassed greatly the average size of the two bronchia, 72.25 mm., against 52.60 mm. In almost all these subjects the pulse was healthy. A boy of five died of tubercular pneumonia, two others of the same age of croup. (b) Twelve subjects above twenty years, of whom eight had healthy lungs, and amongst the latter was an old man of eighty-six. The remaining four were—a man of twenty-one, and a woman of thirty years of age, both deceased from tubercular phthisis; a man thirty-two, affected with suppurating pneumonia; and another of forty-five, in all of whom there was dilatation of the bronchia. The same uniformity showed itself in dogs, and in a sheep examined by M. Sée for this purpose.

(5) The size of the trachea was smaller than that of the two bronchia in eight subjects, of whom five had a very extensive tuberculization of the lungs; whilst

the other three—a man sixty-two, another sixty-eight, and a woman twenty-seven—had healthy lungs.

(6) The size of the trachea is, therefore, shown to be larger than the size of the two bronchia together in eleven subjects, who may be thus summarized: the little boy who died from croup, three emphysematous subjects, four tuberculous (of whom one had a pulmonary emphysema), one with healthy lungs, one man with caseous pneumonia, and a man whose lungs were not examined, and in whom the difference was very small.

The conclusions to be derived from M. Sée's work are the following: 1. In the normal state the size of the two bronchia are equal to the size of the trachea; and it may be added that, according to a small number of measurements which he has made, the size of the bronchial divisions is equal to the size of the bronchia from which they arise. The respiratory ducts, therefore, represent a cylinder and not a cone. 2. In a pathological condition the balance between the relative size of the trachea and of the bronchia is lost, so that sometimes the size of the bronchia is increased, as in chronic tuberculosis, and sometimes the trachea is enlarged, as in cases of emphysema.—*Lancet*, July 13, 1878.

— *Supernumerary Mammæ.*

Among the congenital malformations which excite the surprise of those ignorant of teratological facts, and arouse the especial interest of the evolutionist, is the occurrence of supernumerary mammæ and nipples, so that, instead of the usual sufficient and even superfluous complement, three or even four distinct and separate structures are found. In all ages they have attracted notice, and lately in this country Dr. Sneddon, and abroad M. Bartels and Prof. LEICHTENSTERN have directed attention to them. The work of the latter, which appears in *Virchow's Archiv*, is especially comprehensive, being based on the particulars of thirteen cases which have come under his own observation, and ninety-two which he has found recorded in medical literature. The object for which he has compared them is especially to ascertain the frequency of the occurrence of this anomaly, its most common form and its associations—points on which the statements in medical literature vary much. This knowledge is essential if we would obtain an answer to the further question of the origin of the anomaly, whether it is to be regarded as *bizarre* and accidental, or as the result of some impeded or excessive developmental effort.

It is commonly asserted that extra-rudimentary breasts or nipples are occurrences of considerable rarity in women, and of far greater rarity in men. Leichtenstern, however, having been on the lookout for the condition, is inclined to attribute the supposed rarity rather to the absence of observation than to the infrequency of the malformation, and his experience leads to the conclusion that cases of rudimentary nipples (polythelia), with or without additional glands (polymastia), occur pretty frequently in both sexes, and at least as frequently in men as in women. He believes that the frequency should be estimated at about one in five hundred, and that a very large number of instances might readily be collected if those who inspect large numbers of men, such as military surgeons, had their attention directed to it. Many supernumerary nipples are mistaken for nævi or spots of molluscum. In women it has often happened that the real nature of such a spot was discovered only when pregnancy caused it to assume a functional activity. The circumstance that in women attention is thus attracted to the anomaly, while in men it passes unnoticed, is probably the reason why its occurrence has been noted so much more frequently in women than in men (in the proportion of seven to two). The cases which have come under Leichtenstern's own notice corroborate this view, for nine of them were in men, and four in women.

In the great majority of cases (91 per cent.) the additional nipples were situated on the anterior aspect of the thorax. In extremely rare cases they have been met with in the axilla, on the back, over the acromion, and on the outer side of the thigh. The frequency with which they are met with in these irregular situations has been much exaggerated, and in consequence Darwin concluded that but little weight could be attached to them as evidence of atavism. When found on the anterior aspect of the thorax, they are placed in most cases (94 per cent.) beneath the normal mammillæ, between them and the edge of the ribs. Sometimes the malformation is unilateral, sometimes bilateral, and in the latter case the additional organs are arranged symmetrically or unsymmetrically. In rare cases, the appendages occur above the normal nipples, and then, without exception, are placed outside the normal nipple-line. In two cases only were the extra nipples situated in the middle line of the body. When the addition is unilateral it is much more frequently on the left than on the right side, in the proportion of seven to two. Why this should be is not clear, but it is worth remembering that the normal breast on the left side is more developed, on the average, than that on the right side. This was associated by Hyrtl with the circumstance that the left breast is more used than the right, on account of the facility with which a child can be held upon the left arm, and the right remain free; but this explanation is doubted by Leichtenstern on the ground that the preponderance of the left side is to be noted in young persons, and because when one breast is absent, or small, it is almost always the right breast which thus suffers. Klebs associates this lateral relation with the rotation to the left of the anterior segment of the fœtus in the amniotic investment, and points out that congenital defects in the lung are more frequent on the left than on the right side. The congenital absence of one breast occurs in cases of congenital defective formation of one-half of the thoracic wall, muscular or osseous. On the other hand, however, the presence of supernumerary mammæ has never been seen in conjunction with thoracic defect.

Very different statements have been made regarding the hereditary transmission of this anomaly. In the immense majority of cases certainly no such transmission can be traced. Occasionally, however, it appears indubitable. In this respect the condition resembles some other congenital anomalies.

It has been said that in the lower animals the number of mammæ diminishes according to the developmental grade of the animal possessing them; but this, which has been enunciated as a law, is of but partial application, and does not obtain when different sorts of animals are compared. What is, however, perhaps greater significance in regard to the question under consideration is that in each order considerable individual variations are observed. In the dog, for instance, the number of teats varies, under normal circumstances, from seven to ten. Cuvier enunciated the law, which is no doubt accurate, that the greater the variation in the number of breasts in the same species, the larger is the number normally possessed. The latter is commonly proportioned to the number of young borne by the animal; most of those with two breasts—such as the apes, the solipeds, the Cetacea, and the Edentata—having, as a rule, only one young at a time. In the same tribe as the Pachydermata, species with two breasts—such as the elephant, hippopotamus, and tapir—have only one young at a time; while the sow, with ten breasts, bears from eight to ten young. A popular idea has long obtained in Germany, and has been shared even by medical men, that women with accessory breasts are disposed to twin conception. The polymastia was regarded as an indication of a more highly developed generative system, just as the imperfect development of the breasts may accompany the imperfect development of the uterus. In the last century the question was asked, first of Professor Socin of Basle, and then of the Medical Faculty in Tübingen, whether a certain woman in Basle

who possessed four breasts might marry without incurring great risk of bearing twins. The answer was that she might, and the result justified the conclusion. In the cases collected by Leichtenstern, among seventy women with polymastia there occurred only three twin conceptions.

Glandular structure commonly exists, and the additional breasts may, in very rare instances, be employed for suckling a child. In most cases, however, they are useless for this purpose, and frequently, when the infant is put to one breast, from the other upon the same side milk flows. The symmetrical and regular situation of the accessory mammæ in the human subject is very similar to the position of those of animals which naturally possess more than one pair. Even the axillary position has its analogies in some animals. It is noticeable, however, that the accessory nipples often present a very embryonal character, and possess still the furrow by which the development of all nipples commences. These facts incline Leichtenstern to the opinion of Darwin, that the accessory breasts and nipples are really a reversion to distant primitive ancestors, and announce the existence in man of a latent developmental tendency to the production of more than two breasts, and these observations show that such an event occurs less rarely than has been supposed. The irregularity in position of these accessory organs might be a difficulty in regarding them in the light of a reversion to an earlier type; but as Leichtenstern has shown, this irregularity is much less than has been hitherto supposed.—*Lancet*, July 20, 1878.

Function of the Eustachian Tube.

In a former paper in Virchow's *Archiv*, vol. lxx. p. 447, Dr. HARTMANN of Berlin related some experiments, which proved that by Valsalva's method of inflation of the tympanic cavity a pressure of from 20 to 40 millimetres of mercury was sufficient to cause the entrance of air into the cavity; and that during the act of swallowing a pressure of 20 millimetres or less is sufficient.

He has lately (*Archiv für Anatomie und Physiologie*, Leipzig, 1877) had the advantage of making some experiments in the pneumatic cabinet of the Jewish hospital. This cabinet is so arranged that any desired pressure within a certain limit can be made, and the amount measured by means of a conveniently placed quicksilver manometer. The results of these observations are as follows:—

After entering the cabinet, if the act of swallowing be avoided, a feeling of pressure is experienced on the membrana tympani, with a pressure of from 10 to 40 millimetres, which on the increase of the pressure from 40 to 60 millimetres, becomes painful. When this was passed, Dr. Hartmann was compelled, on account of the pain, to take refuge in the act of swallowing. Before the swallowing, the membrane is congested and pressed inwards; but, on swallowing, it is placed in a condition to be able to return to its normal position, since the equilibrium between the air of the cabinet and the tympanic cavity is again restored. This at once relieves the pain.

From experiments made in relation to the amount of pressure required to cause entrance of air into the cavity, he concludes that by Valsalva's method of inflation no actual position of rest of the muscular structure of the tube is reached, but that, during the inflation, only a more easy access is given to the passage of air through the tube. The exit of air from the cavity requires less change of pressure than for the entrance; and Dr. Hartmann assumes that the tube acts as a valve, which opens towards the naso-pharyngeal cavity, while by heightened pressure in that cavity it remains closed. Vocalization causes, like Valsalva's method, changes which allow an easier entrance of air into the cavity, but the act of swallowing is the only method of restoring the equilibrium between the tympanic and pharyngeal cavities.—*London Med. Record*, June 15, 1878.

Glycogen.

Some interesting observations on the chemistry and physiology of glycogen are contributed to the *Wiener Med. Jahrbuch* by Dr. ABELES. In order to ascertain the amount of glycogen in muscle, it is necessary to digest it with caustic potash and separate the albuminous bodies by means of a large quantity of a solution of iodide of potassium and mercury. Abeles proposes to separate them, instead, by chloride of zinc, the solution having previously been rendered almost neutral by hydrochloric acid. If it be boiled for from twenty to thirty minutes with the zinc, the albumen is precipitated in a dense mass, and the solution is readily filtered. The glycogen may then be precipitated by alcohol. No formation of sugar from the glycogen occurs during the boiling with chloride of zinc.

Glycogen can also be precipitated, it is found, by baryta. If a saturated solution of baryta be added to a solution of glycogen, an abundant white precipitate is formed, which sinks to the bottom of the vessel on standing. When collected and dried in vacuo at a temperature of 212° F., it was found to have the following composition: $C_{18}H_{30}O_{16}Ba$. The same precipitate occurred when baryta-water was added to a liver decoction, and from it the glycogen could be liberated by dilute sulphuric acid; but this method is found to be not very convenient, because the barytic sulphate separates from the solution of glycogen slowly and with difficulty.

It is well known that curara produces glycosuria, but the mechanism of the production of the sugar is a point which has been much discussed and is still uncertain. Bernard thought that it was by the influence of the poison on the nerves of the liver. Abeles has found that the sugar in the blood of a dog which had fasted for five days was .046 per cent., and that an hour after poisoning with curara it had risen to .13 per cent. He believed that so considerable an increase in the amount of sugar in the blood could not possibly arise from a transformation of the glycogen which remained in the liver after five days' fasting. He accordingly investigated the amount of glycogen in the muscles before and after poisoning by curara. The animal having been narcotized, a piece of muscle was excised from one leg; curara was injected, artificial respiration maintained for (in different cases) from twenty-five minutes to an hour and three-quarters, and then a similar piece of muscle removed from the other leg. In all cases the amount of glycogen in the muscle after the curara was larger than before the injection; the anticipated diminution in the glycogen could not in any case be found. The experiments thus appear to support Bernard. They show, at any rate, that the sugar which passes into the blood is not derived from the glycogen of muscle.

Glycogen, in large quantities, appears to be an active blood-poison. Böhm and Hoffmann have injected it into the jugular vein of cats, and found that after the injection of from three to ten grammes, the urine contained hæmatin. Hence it appears that glycogen is one of those substances which can dissolve the blood-corpuscles. The urine contained albumen, and, when this was separated, rotated polarized light to the right, and reduced oxide of copper, but the reduction was far less than corresponded to the amount of action on polarized light. This dextro-rotatory substance could be separated by the addition of six or eight volumes of alcohol, and it was then found to be soluble in water without opalescence, to give no colour with iodine, to have no power of reducing Fehling's solution, but to be transformed into grape sugar by sufficient boiling with acids. The average rotating power on light was found to be 194.3° , a lower power than glycogen, which was determined, on an average of seven observations, to be 226.7° . Hence the substance corresponds to the achroodextrin of Brücke.—*Lancet*, July 13, 1878.

MATERIA MEDICA AND THERAPEUTICS.

The Physiological Action of Purgatives.

This subject has recently been reinvestigated by L. BRIEGER (*Archiv für Exp. Pathologie*, viii.), on the basis of Moreau and Brunton's experiments. Large dogs, which had been kept a day or two without food, were used. They were chloroformed, and then a loop of small intestine was ligatured in two places, and thoroughly washed out with warm water through small openings made just to the inner side of the ligatured points. These openings were then carefully closed with sutures, and the isolated loop of gut was divided into three parts, each from twenty to twenty-five centimetres long. The experimental purgatives were then slowly introduced into the two outside compartments, the central one being left for comparison. The animals were generally killed, and the parts examined, about four hours and a half after the injection, but sometimes later. Dilute solutions of saline aperients (sulphate of magnesia, common salt) were absorbed without causing any change in the bowel; but as the strength of the solution was increased, the ligatured bowel contained more and more clear yellow alkaline liquid, containing flakes of mucus, intestinal epithelium, and mucous corpuscles. Drastic drugs (croton oil, colocynth) caused the secretion of a bloody liquid, or even set up diphtheritic inflammation of the mucous membrane, while laxatives such as senna, rhubarb, aloes, gamboge, and castor oil invariably caused firm contraction of the muscular coats, the injected drug, its watery parts being absorbed, being found spread over the whole mucous membrane, which was *not* inflamed. The result was the same if the animals were killed as late as sixteen hours after the injection. It thus appears that laxatives mainly act by exciting peristaltic contraction of the intestine; whereas salines, as was previously known, attract water into the bowel, and also induce abundant secretion from the intestinal glands. On the other hand, drastics in small doses have a similar action to laxatives, but in large ones they cause inflammatory exudation and hypersecretion. Brieger's results, therefore, differ from those of Moreau and Brunton in the rôle he assigns to the laxatives. If we remember rightly, the latter observers found that the various purgatives used agreed in producing a copious transudation of watery fluid into the bowel, and this Brieger only admits in the case of the saline and drastic aperients.—*Med. Times and Gaz.*, Aug. 3, 1878.

Subnitrate of Bismuth.

Prof. GUBLER (*Bull. de l'Académie*, July 16), speaking of this substance at the Académie, observed that it is a mechanical absorbent just like any other dry powder; and it is a certain antacid, for while it does not absorb carbonic acid gas, which is secondary, it efficiently absorbs the normal acids in excess in the gastric juice, and especially the acids formed accidentally at the expense of alimentary or other matters introduced into the *primæ viæ*—acetic and lactic and volatile fatty acids. Moreover, the basic salt of bismuth possesses the very great disadvantage of absorbing sulphuretted hydrogen gas, or of producing with the sulphohydrate of ammonia, by double decomposition, nitrate of ammonia, and sulphuret of bismuth. In this latter effect bismuth can only be replaced with difficulty, chalk, in particular, the employment of which would be so convenient, so cheap, and so inoffensive, not seizing hold of sulphuretted hydrogen. Oxide of zinc is the only other substance that can fulfil all the indications so well met by bismuth, and it easily becomes nauseating or emetic. It is, however, a remarkable thing that this inconvenience especially occurs when small doses of the oxide are em-

ployed—as from a twentieth to a fifth of a gramme—which always meet with enough acid in the stomach to convert them into neutral salts. When large doses are given—as a half to one, two, three, and four grammes per diem—they are exempt from all emetic properties, and especially when united with sufficient bicarbonate of soda to neutralize the acids of the *primæ viæ*. This combination furnishes excellent results in the same cases in which bismuth succeeds. The oxide of zinc, indeed, has this advantage over bismuth: that its sulphuret is white, and thus does not mask the presence of blood in the stools; nor does it raise fears in the mind of the timid of the presence of melæna.—*Med. Times and Gaz.*, Aug. 3, 1878.

Oil of Rosemary.

Professor KÖHLER and HERT SCHREIBER, of Halle, have published in No. 23, *Centralblatt Med. Wiss.*, the results of some experiments on the physiological action of oil of rosemary, which may turn out to be of great therapeutic value. The chief action of the oil is on the cerebro-spinal nerve-centres. The blood-pressure falls, owing to paralysis of the vaso-motor centre in the medulla, but the heart is unaffected, and there is only retardation of the pulse if the drug is pushed to its utmost extent; in the latter case the respiratory centre becomes ultimately paralyzed. Reflex excitability is increased by small and diminished by large doses of the oil, or by the repeated injection of small ones. Large doses antagonize the pathological irritability induced by strychnia. The most important effect of the oil, however, is on the temperature, though for this purpose it must be inhaled in the form of vapour, and not given by the stomach. By the latter form of administration only a temporary reduction of about 2° centigrade can be obtained; whereas by inhalation the temperature may be reduced without difficulty as much as 8°. If the same effect can be produced on the febrile human subject without the development of other poisonous symptoms, the inhalation of oil of rosemary may prove to be a useful addition to our antipyretic remedies, and we hope to hear before long that the experiment has been tried and succeeded. Köhler and Schreiber did not find the abortive action which has been ascribed to the oil confirmed in experiments on rabbits. Its stimulant effects excite peristaltic action of the bowels, and produce slight diarrhœa. The oil appears to be diuretic if given by the stomach or by inhalation, and the urine passed by both animals and men under these circumstances smells distinctly of violets. Its prolonged administration *per orem* for many weeks may produce a slight degree of fatty change in the liver, and nephritis, with albumen and casts in the urine. The irritability of the muscles is never affected by poisoning with oil of rosemary, nor has any alteration in the size of the pupils been observed.—*Med. Times and Gaz.*, Aug. 3, 1878.

Comparison of Opium, Belladonna, and Aconite.

M. JULES SIMON establishes the following comparison between opium, belladonna, and aconite: 1. In regard to their action on the alimentary canal, opium causes thirst, dryness without acrimony, want of appetite, nausea, vomiting, constipation; belladonna, thirst, dryness with acrimony, nausea, vomiting, and diarrhœa; aconite, dryness, sensations of pricking and burning of the tongue, salivation in full doses, vomiting, and diarrhœa. 2. In regard to their action on the circulation, opium acts as a stimulant, causes diminution of pressure, though it is sometimes without action, and in large doses causes acceleration of the pulse and collapse. Belladonna acts as a sedative, lowers the strength, retards the frequency of the pulse, and produces a febrile state of the system. Aconite acts as a sedative, diminishes the arterial tension, renders the face pallid, retards the fre-

quency of the pulse, and stops the heart in diastole. 3. In regard to the respiration, opium allays dyspnoea, when present, by diminishing the bronchial secretion; in large doses it causes collapse. Belladonna calms down excited respiration, diminishes secretion, and in large doses renders respiration spasmodic and irregular. Aconite retards respiration by its direct action on the nerves. 4. In regard to their action in febrile states, opium augments the cutaneous secretions, and produces general malaise, erythema, and eruptions. Belladonna produces neither sweating nor general discomfort, raises the temperature, and sometimes causes scarlatina-like eruptions. Aconite lowers the temperature. 5. In regard to their actions on the secretions, opium diminishes the quantity of urine, and in fact diminishes the secretions generally. Belladonna causes augmentation of the renal secretion, with diminution of the bronchial secretion. Aconite causes increase of the urinary secretion, but diminishes the bronchial secretion. 6. In regard to their action on the nervous system, opium acts chiefly on the cerebro-spinal system, belladonna on the cerebro-spinal system, and aconite on the spinal cord. Opium causes somnolence, sleep, intoxication, vertigo, muscular debility, diminution of common sensibility, contraction of the pupil, diminution of the activity and vigour of reflex actions. Belladonna causes sleeplessness, gay or furious delirium, hallucinations, muscular agitation, diminution of the sensibility of the face, dilated pupils, and remarkable diminution of the reflex acts. Aconite leaves the intellectual faculties intact, but causes muscular torpor, anæsthesia, hallucination of the senses, diminution of reflex actions, and produces slight dilatation of the pupil.—*Lancet*, July 20, 1878.

Butyl Chloral.

According to Prof. LIEBREICH (*Lancet*, July 20, 1878), in the human subject, as well as in the lower animals, the first action of the drug is to produce anæsthesia, which begins in the head and gradually passes to the rest of the body, reflex irritability remaining intact in the limbs for some time after it has been abolished in the head. Then follows narcosis; but it is important to observe that anæsthesia in the head and face may be complete before any trace of narcosis manifests itself. From a consideration of this fact Professor Liebreich suggests the use of butyl chloral in operations on the face, in cases where other anæsthetics are contra-indicated. The dose for this purpose is from one to two grammes (15 to 30 grains).

In some remarks on the action of butyl chloral on the heart and the manner of death in fatal cases, Prof. Liebreich points out, that, whereas in the case of chloral hydrate the heart was paralyzed and its action ceased before the movements of respiration came to an end, the reverse held good in the case of butyl chloral. A fatal dose of that substance attacks the respiratory centre in the medulla oblongata and paralyzes it, while the heart is unaffected and continues to pulsate for some time after death.

To demonstrate this fact Professor Liebreich showed two rabbits, both of which were in a state of complete narcosis, the one from the effects of chloral hydrate, the other from butyl chloral. In the case of the first animal the thorax was opened just as all respiratory movements ceased. The heart was lying motionless, both ventricles being dilated and filled with blood. Artificial respiration had no effect in reproducing the cardiac contractions. But, on the other hand, when the thoracic cavity of the rabbit poisoned with butyl chloral was opened (at exactly the same stage) the heart was found to be beating regularly, and to all appearance normally. After about two minutes the beats, which during that period had become slow, ceased. Artificial respiration at once restored the pulsations, and so long as the rhythmical inflation of the lungs was kept up, the contraction of

the heart continued; thus affording an admirable illustration of the views as to the action of the drug which had been enunciated in the course of the lecture. Professor Liebreich also indicated that this property gave the drug considerable advantage as an anæsthetic for vivisectional purposes, especially in England.

Prof. Liebreich refers to the value of butyl chloral in cases of tic douloureux, and advises its administration, dissolved in glycerine and water, rather than in alcohol, in doses of from one to two grammes.

Misuse of Bromide of Potassium.

According to BOETTGER (*Allgemeine Zeitschrift für Psychiatrie*, Band xxxv., Heft 3), it is by no means uncommon for methods of treatment of the greatest importance, so soon as they become well known to the laity as well as to the profession, to be so misapplied as to cause unfavourable results, and thus to bring general discredit upon procedures which, when adopted with discrimination, are of the highest value. As instances of this may be cited, the administration of chloroform and of hypodermic injections, especially of morphia; also the use of chloral hydrate; from the abuse of all of which the most lamentable effects are frequently brought under our notice.

Among the class of nerve and hypnotic medicines, bromide of potassium has of late taken very high rank; administered timidly at first in small doses, it is now freely given in large quantities, its use as a hypnotic is constantly becoming more frequent, it has taken an important place in the materia medica of alienists, it has been recommended as a sovereign remedy for epilepsy, and the literature of the subject is already very considerable. All these circumstances render the drug peculiarly liable to abuse. For a long time it was regarded as incapable of doing harm, until Seguin showed that its indiscriminate use was greatly to be deprecated, and that the long-continued administration of preparations of bromine may, and often does, give rise to a well-defined disease (bromism), characterized by the following symptoms: feelings of weakness and lassitude, depression of the heart's action, coldness of the extremities, a peculiar heaviness of speech, a pustular or papular eruption of the skin (which may be confined to a few spots, or may be so abundant as to resemble that of variola), and, lastly, a peculiar, sweet, but unpleasant odour of the breath, which Dr. Boettger has invariably been able to distinguish in patients who have taken the drug continuously.

In still higher degrees of bromism, with which the present paper is more directly concerned, Seguin found that stupor supervened, memory and articulation seemed to be especially affected, hallucinations of all the senses were observed, tremor of the muscles came on with unsteady gait, all movements became uncertain, and the more delicate ones impossible, the pupils were unequal and reacted only slowly; in male patients sexual power, and in females menstruation, was disturbed. It is evident that a patient in this advanced stage of bromism might easily be taken to be suffering from paralytic dementia. Seguin admits that the diagnosis might present great difficulty, and Boettger has actually experienced it; the history of the case is the most important point from which to form an opinion. A fatal issue is, moreover, not uncommon in severe cases of bromism. The following case illustrates well the resemblance between advanced bromism and the last stage of general paralysis.

Herr C. R., aged 29, well-educated, had no hereditary predisposition to insanity, and had previously enjoyed good health. With the exception of some severe hardships which he suffered while serving in the Franco-German war, he had always led a steady and regular life. After not having felt quite himself for

some time, and suffering from want of mental activity, etc., in June, 1877, marked depression set in, accompanied by delusions of persecution and hallucinations of various senses. Continuous sleeplessness being also present, his medical attendant prescribed bromide of potassium in doses from 80 to 90 grains *per diem*. The patient, however, took the drug irregularly; on some days he only took 45 grains, but on others as much as 150 and 180 grains; within four months he consumed about 35 ounces of the drug, giving an average of over 130 grains daily. During this time his condition became rapidly worse, he became stupid and forgetful, his features lost their expression, and his bearing was careless and unsteady. His speech was heavy, though not exactly stammering, muscular tremor supervened, and the patient's gait became staggering. In this condition, he was brought to Dr. Boettger at the Carlsfeld Asylum as a case of general progressive paralysis. The first impression made by the patient seemed to justify this diagnosis. Besides the symptoms mentioned above, it was noted that the pupils were very unequal (the left being the smaller), and both reacted very slowly; the tongue was slightly coated, tremor of its muscular bundles was observed, and it was inclined to the left side; speech was slow, heavy, and interrupted by long pauses, as if the patient had a difficulty in thinking of his words. The pulse was small and faint, the surface-temperature low; his whole appearance indicated mental and physical decay. The entire body inclined markedly towards the left side, as is frequently the case in paralytic patients. The peculiar faint sweet smell of the breath, already noticed as occurring in bromism, was very marked. The first diagnosis made was that of paralytic dementia.

At first, small doses of the bromide were given, and the patient rapidly became more stupid and unsteady in his gait; he once fell while walking and injured his forehead, when it was noted that sensibility to pain was greatly diminished. After a very few days, owing to loss of appetite and strong fetor of the breath, the bromide of potassium was discontinued, quinine and iron being prescribed instead; the immediate improvement in the patient's condition, combined with other considerations, very soon made it clear that the case was one of bromism. The patient had to be fed with a spoon, and took only liquid and soft food for some time; the stupidity continued for about a month; after that time Herr R. became gradually more active; his bearing was more upright, and his countenance showed more expression; his gait also became more sure, and the fetor of his breath disappeared. Appetite and interest in things in general returned. Memory also improved, but was quite extinguished for events which had occurred during the height of the bromism. During the next few months the patient rapidly recovered, all the parietic symptoms passed away, and he is now enjoying good mental and bodily health.—*London Medical Record*, Aug. 15, 1878.

Therapeutic Action of Iodoform.

Dr. MOLESCHOTT (*Wiener Medicin. Wochenschrift*, Nos. 24, 25, and 26, 1878) states that he has used iodoform with good result in the treatment of exudation into the pleura, pericardium, and peritoneum, and of the acute hydrocephalus of children. He generally applied it in the form of ointment (1 in 15 of lard) or with elastic collodion (1 in 15 of collodion). Large glandular swellings were caused to disappear under the use of the iodized collodion. It was found useful as a means of assuaging pain in gout, neuralgia, and neuritis. Syphilitic myocarditis was cured by iodoform inunction, combined with the internal use of the drug in doses of from three-fourths of a grain to a grain and a half daily. Iodoform appears to act like digitalis on the heart, increasing the strength and reducing the frequency of its beats; and was hence used successfully in uncompensated valve-disease. Its action depends probably on its ready decomposition,

by which the iodine in a nascent state is brought into action on the tissues.—*London Med. Record*, Aug. 15, 1878.

Action of Pilocarpin.

Dr. A. LOESCH (*Deutsches Archiv. für Klin. Med.*, Band xxi., Heft 2 and 3) found that the subcutaneous injection of 2 centigrammes (0.3 grain) of muriate of pilocarpin in dropsical and non-dropsical cases was followed in a period varying from two to five minutes by diaphoresis and salivation, varying in intensity, but generally lasting an hour and a half or two hours. The loss of weight was as a rule from 700 to 900 grammes; in some cases it was twice as much, in others much less. The internal administration of 4 centigrammes (0.6 grain) was followed at the end of 23 minutes by an increased secretion which lasted only 15 minutes. Severe vomiting was sometimes observed; this unpleasant symptom also follows the use of jaborandi. Dr. Loesch warns against the use of pilocarpin in cardiac affections, as its effect on the heart's action was always considerable. This was in some cases increased, and sometimes was rendered irregular.

Fränkel (*Charité-Annalen*, 1878) gives an account of experiments on dogs performed by him in conjunction with Leyden, from which the conclusion is drawn that a deleterious action on the heart is not to be expected from the use of the drug. Doses up to 0.6 grain had but little effect on the frequency of the pulse and the arterial pressure, as measured by the kymograph. When the amount injected was increased, the frequency of the pulse was remarkably reduced, even when both vagi were divided; but, when once a certain limit had been reached, there was no further reduction of frequency even under increased doses, provided that artificial respiration were practised. The injection of small quantities of atropia at once interrupted the action of the pilocarpin. These drugs thus seem to be antagonistic in their action on the secretion of sweat.

Dr. Fränkel relates some cases in which the use of pilocarpin was followed by beneficial results. In a case of acute nephritis, 25 milligrammes (three-eighths of a grain) of pilocarpin were injected every day for seven days in succession, then every second or third day; the result was removal of the œdema, and restoration of the normal secretion of urine. In two analogous cases, recovery followed injections made on alternate days for 3½ weeks and 14 days respectively. A fourth case was one of bronchial catarrh with severe cyanosis, œdema, ascites, dyspnœa, and scanty secretion of urine. Expectant treatment and digitalis were useless; treatment by pilocarpin was at once followed by improvement and ultimately by cure.—*Lond. Med. Record*, Aug. 15, 1878.

Action of Muriate of Pilocarpin in Children.

Dr. DEMME, of Bern (*Centralzeitung für Kinderheilkunde*), has administered muriate of pilocarpin by subcutaneous injection to 33 children. Of these, 18 suffered from desquamative nephritis with dropsy after scarlatina; 3 from nephritis after diphtheria (without scarlatina) and a high degree of dropsy. In 12 cases, the diseases were dropsy from disease of the valves of the heart, multi-articular rheumatism, whooping-cough, broncho-pneumonia, and parotitis. The ages of the children varied from 9 months to twelve years. The dose administered subcutaneously was—up to the end of the second year, 5 milligrammes (0.075 grain); from the second to the sixth year, 7.5 milligrammes to 1 centigramme (0.11 to 0.15 grain); and from the seventh to the twelfth year, 1 centigramme to a quarter of a gramme.

The injections were well borne, except in two cases; in one of these, vomiting, hiccup, pallor of the face, and syncope; in the other, yawning, hiccup, and

twitchings of the limbs, appeared from three to five minutes after the injection. The proper action of the pilocarpin was imperfect in both these cases.

Pilocarpin was found to be an excellent diaphoretic and sialagogue. The latter action was more marked in very young children, the former in older ones. The action usually commenced from three to seven minutes after the administration, increased up to 15 minutes, remained at its height up to 20 or 40—and in rare cases 75—minutes, and then gradually ceased. There was an inconsiderable fall of temperature. The frequency of the pulse was increased by 20 to 60 beats; the pulse-wave was fuller. The amount of urine was only exceptionally increased; in two cases there were watery stools. Dr. Demme arrives at the following conclusions:—

1. Pilocarpin is an effective diaphoretic and sialagogue in childhood.
2. It is borne very well, in appropriate doses, even by children of very tender years.
3. Unfavourable after-symptoms are but rarely observed, and, probably, may be altogether prevented by the administration of small doses of brandy before the injection.
4. The conditions in which it is chiefly indicated are the parenchymatous inflammations of the kidney with dropsy, following scarlatina.
5. Pilocarpin does not appear to exercise an influence on the heart's action.—*London Med. Record*, Aug. 15, 1878.

Action of Pilocarpin and Cotoin.

Dr. CLOËTTA read a paper on this subject to the Medical Society of the Canton of Zürich (*Correspondenz-Blatt für Schweizer Aertze*, Band vii.). In healthy horses, the subcutaneous injection of half a gramme of Merk's muriate of pilocarpin was followed in three minutes by an increased flow of saliva; in eight minutes, the pulse rose from 40 to 60; in ten minutes, sweating followed, first at the place of injection, and thence spread towards the head and over the whole body. The temperature in the rectum remained equal; that of the skin fell considerably. The loss of weight (excluding feces and urine) amounted in an hour and three-quarters to more than 22 pounds—more than 2 per cent.

In man, similar phenomena were produced by the subcutaneous injection of one or two centigrammes (0.15 to 0.3 grain); salivation, feeling of heat in the head, redness of the face, throbbing of the carotids, and sweating on the head and then on the rest of the body. The pulse increased from 20 to 40 in the minute; the breathing was quickened. The use of two centigrammes was generally followed by nausea. The action of the drug lasted one or two hours; the temperature in the rectum was unchanged; that in the axilla fell sometimes as much as 3 or 4 deg. Fahr. No diuretic action was observed.

The results of Dr. Cloëtta's experiments have led him to question whether pilocarpin has much therapeutic value. Neither in dropsy following heart-disease or chronic nephritis, nor in pleuritic exudations, was the use of pilocarpin followed by improvement.

Dr. Cloëtta cannot give a theory of the therapeutic action of cotoin; but he has found that diarrhœa, especially of the catarrhal form, is arrested in a short time by it; and he recommends a trial of it in the summer diarrhœa of children. He gives adults a decigramme (1.5 grain) several times a day; or, instead of this, and with similar results, 3 decigrammes (4.5 grains) of paracotin.—*London Med. Record*, Aug. 15, 1878.

Therapeutic Uses of Coto.

Dr. FRONMULLER of Fürth contributes to the *Allgemeine Medicinische Central-Zeitung* of July 10th an article on the uses of coto-bark and its alkaloids

cotoin and paracotoin. Since the middle of February, 1877, he has administered coto and its preparations in about 200 cases. In 143 he has kept tabular accounts of the results, taken at the bedside.

As regards age, 3 patients were between 1 and 10; 27 between 10 and 20; 65 between 20 and 30; 36 between 30 and 40; 7 between 40 and 50; and 5 between 60 and 70. The diseases from which the patients suffered were: tuberculosis of the lungs, 62 cases; typhus (? enteric), 38; catarrhal diarrhœa, 12; acute articular rheumatism, 8; gastric disorder, 6; pneumonia, 6; menstrual colic, 3; bronchitis, 2; œdema of the feet, 2; catarrh, 1; anorexia, 1; diphtheria, 1; albuminuria, 1. Along with these, there were 93 cases of severe diarrhœa, mostly colliquative, and 91 of excessive sweating; these complications often occurred simultaneously.

Of the various preparations, tincture of coto was given in 109 cases in quantities varying from 15 to 500 drops daily—the average amount being 100 drops; in 24 cases cotoin was given, generally in the form of powder, in doses of $1\frac{1}{2}$ to $4\frac{1}{2}$ grains several times daily; in 5 cases, paracotoin was given in somewhat larger doses; and in 5 cases coto-pith.

The clinical use of the preparations of coto was for the most part only directed against symptoms, principally immoderate diarrhœa and excessive sweating.

a. In diarrhœa, against which other remedies had for the most part proved useless, coto was given in 92 cases—85 times in the form of tincture. The diarrhœa was mostly colliquative, following typhus and tuberculosis. In 50 cases the diarrhœa was stopped; it was diminished in 26; and the remedy remained without effect in 9 cases. Of the 50 successful cases, 13 had doses varying from 10 to 50 drops; 12 from 50 to 100 drops; and 25 from 100 to 500 drops, in the course of the day. Of the 9 unsuccessful cases, 4 had from 10 to 50 drops; 3 from 50 to 100 drops; and 2 from 100 to 500 in the day. After some days, the symptoms—especially colliquative diarrhœa—returned, but could be again arrested; frequently, however, the evacuations soon became normal.

It thus appears that the best results were obtained with large doses. The tincture (1 part of coto-bark in 9 of alcohol at 85 per cent.) was used sometimes pure, sometimes mixed with water, and generally was readily taken. It sometimes only happened that the patients complained of burning and irritation in the throat, especially when full doses of the tincture as prepared in the dispensary were given. The tincture prepared by Merk of Darmstadt was milder and easier to take. A special advantage of this remedy is, that it is very well borne and generally increases the appetite, while the other ordinary astringents, such as opium, tannin, nitrate of silver, etc., usually produce very unpleasant effects on digestion or on the sensorium. The average dose is 50 drops three times a day, either pure or with sugar or water.

b. As regards immoderate sweating, Dr. Fronmüller observed in the case of a phthisical patient, suffering at the same time from colliquative diarrhœa and sweating, that, under the use of full doses of tincture of coto, both these symptoms disappeared. After this, he gave tincture of coto in 91 cases of excessive sweating; in 34 with complete, in 36 with partial success, and in 21 without result. The beneficial action of coto, which seems to have as its basis the raising of the energy of the bloodvessels of the skin, generally lasted only one night, but often for a longer time. Digestion was not interfered with; the appetite was indeed often increased, so that Dr. Fronmüller was led to give the tincture as a stomachic in the morning in some cases of anorexia. This absence of any injurious effect on digestion gives coto a great advantage over other remedies used to arrest sweating, such as tannin, lead, nitrate of silver, aconite, alum, etc.

Dr. Fronmüller has given cotoin and paracotoin in eighteen cases of diarrhœa.

of various forms; in nine with complete and in six with partial success, and in three without result. He has also given them in eighteen cases of night-sweat; in eight with complete, in nine with partial success, and in one without result. Paracotoïn was given in five cases; cotoïn in thirty-one.

The addition of concentrated nitric acid to urine passed about six hours after the administration of cotoïn produced a red colour, which, however, was no longer observed a few hours later.—*London Med. Record*, August 15, 1878.

MEDICINE.

Local Temperature.

M. PETER lately communicated to the Académie de Médecine an interesting note on local temperatures. He has found that in pleurisy the parietal temperature is always higher than the average parietal temperature, which is 35.8° C. (96° F.). The local increase is from half a degree to 2° C. higher, and may even rise still more. The elevation increases with the effusion, and decreases during the stationary period of the effusion, but in general the parietal temperature of the affected side is from $.5^{\circ}$ to 1.5° C. higher than the opposite side. The local temperature gradually falls when the effusion undergoes spontaneous absorption, but remains several tenths of a degree higher than that of the normal side. This persistence of the local elevation explains the possibility of a relapse. In cases of pleurisy without effusion the local rise is less than in cases with effusion, and the return of the normal temperature is more rapid. The degree of elevation of the local temperature is greater than that of the axillary temperature, and the local precedes the axillary rise—a fact which demonstrates the influence of the local process on the general temperature. When the effusion is removed by paracentesis, a sudden local rise of temperature occurs, which is explained by M. Peter as due to the sudden hyperæmia of the vessels from which the preceding pressure has been withdrawn; and this hyperæmia explains not only the more abundant cells of the second effusion, but also the syncope, pulmonary congestion, and dyspnoea sometimes observed when a large quantity of fluid is suddenly removed.—*Lancet*, July 13, 1878.

Ergot in Typhoid Fever.

M. SIREDEY (*Journal de Médecine et de Chirurgie Pratiques*, February, 1878) gives an account of a young man, aged 20, who recovered from a very severe attack of fever after the use of ergot. The patient entered the Hôpital Lariboisière on the tenth or twelfth day of the disease. The tongue was very dry and brown, the gums were covered with sordes, speech was difficult, and the ideas were confused. At night the patient had constant delirium, with subsultus and other nervous phenomena, great pain in the back of the neck, opisthotonos at times, and symptoms like meningitis. The next day the abdomen was retracted, and signs of collapse seemed to portend early death. M. Siredey, bearing in mind the success attained by M. DUBOUE (of Pau) in the treatment of ataxo-adyamic cases by ergot, prescribed 30 grains to be taken during the day. On the following morning the muscular twitchings had ceased, the abdomen was less drawn in, and the general condition was improved. The ergot was continued for three days, after which the indications of danger entirely disappeared, and the fever ran its course with moderate intensity.

M. Duboue recommends ergot in typhoid fever for reasons deduced from its physiological action, and in one of his works (*De quelques Principes fondamentaux de la Thérapeutique*) cites seven cases in which it was employed successfully. One patient, a woman, who was three-and-a-half months pregnant, was treated with ergot for fifteen days, and recovered without miscarriage, although she took a daily dose of 22 to 30 grains of the drug.—*London Med. Record*, June 15, 1878.

Peripheral Hysteria.

In the June number of the *Archives Générales de Médecine*, there is a paper by Professor LASEGUE on certain local manifestations of hysteria, which he terms "*hystéries périphérales*." We must admit, says the writer, that the origin of hysteria may be either central or peripheral. In the former case the brain or the spinal cord may be the causative agent of the hysterical manifestations, or, as is frequently seen, the two combined. Certain patients who are subject to the most marked convulsive attacks never suffer from any mental disturbance whatever; while others, who have been always free from every form of spasm or convulsion, as well as from anæsthesia or hyperæsthesia, and who have never had what is properly termed a *fit*, may nevertheless suffer from many forms of cerebral disorder, varying from the slightest perversion of the intellect to confirmed delirium.

It is not of any of these forms of hysteria, however, that Dr. Lasègue is treating in the present paper, but of those manifestations which he considers to have a peripheral origin. These manifestations, he says, are local, non-symmetrical, and without any tendency to become symmetrical later; they occupy very limited regions, and are most frequently in relation with but a limited portion of the nervous system. Their localization is not a matter of chance. We can observe the manner in which they begin and their mode of evolution, whereas the origin of hysterical manifestations due to a central cause almost always escapes our notice.

The author gives as his first example of "peripheral hysteria" the case of a girl, fourteen years old, who, having suffered for a few hours from epiphora and some redness of the eyelids after a playmate had thrown some sand into one of her eyes, awoke the next morning with a spasm of the eyelids on that side, which rendered it impossible for her to open that eye; and it remained closed during four months, notwithstanding various remedies were tried. At the end of that time the spasm ceased suddenly one night, and never returned.

Dr. Lasègue considers that the irritation produced by the sand was no doubt the immediate cause of the spasm, but cannot be regarded as adequate to account for its long duration, which he looks upon as an hysterical phenomenon; and his view is confirmed by the fact that the patient became afterwards the subject of various hysterical manifestations, although previously to the conjunctivitis she had been free from anything of the kind.

Several other cases are brought forward as examples of "peripheral hysteria," provoked by some local external cause. One of Dr. Lasègue's patients, whose voice and singing were much admired, suffered for nearly two years from complete extinction of voice, and this came on during her convalescence from a very slight attack of bronchitis, which had not affected the voice, or but very little. Another, after an attack of indigestion, fearing to bring on the pain again, refused to touch either food or drink for twenty-four hours; and when at the end of that time she attempted to drink a cupful of milk, the whole came back, evidently in consequence of a constriction of the pharynx or œsophagus. This constriction lasted for some weeks, and even after it ceased the spasm would return occasionally. Space will not allow us to enumerate the many other examples of

peripheral hysteria cited in Dr. Lasègue's interesting paper. He concludes by saying that it is evident there are certain subjects in whom the slightest traumatic irritation may determine a spasm of exceptional obstinacy. Such spasms he would designate rather by the name of *hysteroid* than *hysterical*. If they are found in certain cases to be merely the precursors or successors of the ordinary hysterical "attacks;" they may also be, for some years at any rate, the only manifestations of the disease.—*London Med. Record*, Aug. 15, 1878.

Death from Goitre.

An extremely interesting monograph on *Death from Goitre and the Radical Cure of Goitre*, by Professor ROSE, just published by Hirschwald, throws a new light upon the cause of sudden death in goitrous persons which has been frequently observed, and sometimes in the course of operation. In three such cases, Rose has found that the pressure of the increased thyroid has led to the fatty degeneration of the cartilaginous rings of the trachea, thus transforming the rigid and resisting cylinder of the air-tube into a membranous and flaccid canal. A sudden movement of torsion or of flexion of the head suffices, then, to make an elbow in the tube and flatten its lumen. This change is also accompanied by fatty degeneration and dilatation; and thus we have here all the conditions of sudden death, especially under anaesthesia, or during the brusque movements of the head and neck while an operation is being performed.—*British Med. Journ.*, July 20, 1878.

Tartar Emetic in Pneumonia.

In a case of pneumonia recently treated at La Charité by Prof HARDY, he resorted to the practice of administering large doses of tartar emetic, once so common in Italy and France. The patient was nineteen years of age, and exhibited well-marked signs of pneumonia of a very serious character. Speaking, in his lecture on the case (*Gaz. des Hôp.*, June 29 and 31), on the prognosis and treatment, Prof. Hardy observed that there were some reasons for regarding it as a very serious one. The face of the man (hitherto in good health) was very pallid, and his constitutional powers were much shattered, while facial herpes, which in pneumonia is always of very bad augury, manifested itself. Fever was also very intense, for while in pneumonia the pulse ordinarily oscillates between 100 and 110, here it reached 120. The respirations oscillated between 40 and 50, and there was considerable dyspnoea. The lower three-fourths of the lung were gravely affected, and the crepitant râles at the upper portions indicated that the disease continued to progress.

What treatment was most likely to save the patient? Bouillaud's repeated bleedings can only be resorted to during the first four or five days, and here the sixth had been reached, while the lad was young and very weak, and the pallor of his face, which resembled that seen in the third stage of phthisis, was sufficient to contra-indicate these. Blisters would be required, but would not suffice; and alcohol, although a very useful means, does not cure pneumonia, but only furnishes the patient with strength enough to await the end of his disease, enabling him to last longer than it, and to become cured of it. It is not a means by the aid of which we can act directly against the condition of the lung. While passing these various means in review, it occurred to Prof. Hardy to have recourse to the old practice of giving large doses of tartar emetic. But he did not adopt it in the old centro-stimulant sense of the Italian school. In his opinion the antimony does not excite any special action on an inflammatory disease, but induces merely vomiting and purging; and so far from seeking to obtain "the tolerance" of the remedy formerly sought

for, even by combining it with opium, it is his object to produce the evacuant effect in the most marked manner. To this end he orders from twenty-five to thirty centigrammes in a mucilaginous mixture, of which a tablespoonful is taken every hour or two hours, following each dose by a tepid tisane or sugar and water, in order to produce efficient vomiting and purging. But when vomiting has been produced three times, and purging four times, he leaves off the medicine for fear of producing too much depression. In the present case but two tablespoonsfuls of the mixture had to be given before sufficient vomiting and purging were produced. And on the evening of the day on which it was given the temperature sank considerably, and by twenty-four hours after the antimony was commenced it had sunk from 40° C. to 37.7° , the pulse falling to 70. The breathing was easy and the physical signs were far more favourable. A mixture consisting of twenty-five grammes of brandy was then prescribed in order to keep up his strength, and the next day the thermometer indicated 36.7° , and the pulse was only 66; and by forty-four hours after the antimony had been taken the lung had returned almost to its normal condition.

The case is very interesting in a clinical and therapeutical point of view; for when we leave pneumonia to itself, merely keeping up the strength of the patient by brandy and wine, an abatement of the fever takes place, but the amelioration is only temporary, and it returns. That was seen recently in the hospital in a case of pneumonia at its fourth day, with a temperature of 39.8° , and in which, by means of cupping and the administration of alcohol, the temperature was reduced on the sixth day to 37.5° . Next day, however, the thermometer had risen again to rather higher than 38° . This was very different from the rapid deferescence which took place in the present case. In that case also, although the patient might be considered as cured, having neither cough nor oppression of breathing, still, five or six days after the disappearance of fever, the persistence of the physical signs attested the presence of hepatization of the lung. So it is, in fact, in the subjects of pneumonia, who are treated in this manner—that is, when disease is left to itself, or when attempts are confined to husbanding the strength, the general phenomena are found to cease, and the local ones are amended, but the physical signs persist. In the case which is the subject of the lecture, on the contrary, it is the anatomical condition of the lung itself which has been modified by the treatment—so that in forty-eight hours after the tartar emetic was given all physical signs had disappeared. “The fact proves in a very positive manner the real efficacy of energetic treatment, whether by bleeding or by tartar emetic, administered as I have described. You may be persuaded that, if this latter treatment had not been had recourse to, the disease would have continued; and if, by the fact even of its evolution, the fever had declined, we should still have continued to observe in the lung the physical signs which characterize pulmonary hepatization.”—*Med. Times and Gaz.*, Aug. 10, 1878.

Sudden Death by Embolism.

In the *Archives Générales de Médecine* (June, 1878) Dr. TERRILLON gives the details of two cases in which sudden death was caused by embolism in the right side of the heart. Theoretically such a possibility has been admitted by many pathologists and clinical teachers, but confirmation of the theory has hitherto been wanting or imperfect. The first case cited by Dr. Terrillon is borrowed from M. Tillaux, surgeon at the Lariboisière Hospital in Paris. A woman, 56 years of age, came under M. Tillaux's care for a fracture of the fibula and internal malleolus. The foot was partially dislocated outwards, and the skin was very tense over the malleolus, but without abrasion. The dislocation having been reduced, plaster of

Paris splints were applied, and everything went on satisfactorily till the twenty-third day after the accident, when the limb was found to be painful and swollen. This condition M. Tillaux thought might be due to pressure from the bandages, which he therefore loosened, and the patient was immediately relieved. Twenty days later (forty-three days after the accident), suddenly at the time of the doctor's visit, the patient, without having made the slightest movement, turned pale and ceased to breathe. After one or two minutes, consciousness returned rapidly, and she was able to give an account of her sensations. Dr. Tillaux had scarcely gone the distance of a few beds, when a second and mortal syncope occurred. At the necropsy, a thrombosis was found filling up the popliteal and femoral veins as far as the crural arch; the clot, which was adherent to the walls in almost its whole extent, was free above, fibrinous, and terminated in the form of a serpent's head. The pulmonary artery was free, the lungs sound, except for a slight congestion of the left. The heart was loaded with fat. The right ventricle contained a clot about two centimetres long, twisted in the columnæ carneæ. When this clot was compared with that in the femoral vein, it was manifest to every one that the cardiac embolon was a fragment of the crural clot.

The second case is that of a man who came under Dr. Terrillon's care for multiple fistulæ in the region of the coccyx, with extensive disease of that bone and of the sacrum. Resection of the one (its point excepted, which adhered to the fibrous ligament of the perineum) and rugination of the other were performed, the patient being under chloroform. The dressing was water and carbolic acid, and every morning Dr. Terrillon himself syringed out the wound with the same fluid. The patient's general health greatly improved, and the wound was healing, when one morning, being desired by Dr. Tillaux as usual to turn on his side, he did so, and then remained immovable. All means were tried to rouse him, without success. He took two or three deep inspirations, the pulse beat feebly, the eyes were half shut, the face and lips violet, there was no agony, and he died without having uttered a sound.

The necropsy soon revealed the cause of this sudden death. All the veins surrounding the diseased parts of the bones were full of clots and bathed in pus. The great veins of the pelvis, however, were intact, viz., the femoral, hypogastric and inferior vena cava. The left side of the heart was intact and in systole. It contained a few drops of blood, but no clots. The right side, on the contrary, contained, between the tricuspid valves, a clot about ten or twelve centimetres (four or five inches) long, cylindrical in form, scarcely as thick as a quill, entangled in the chordæ tendineæ, and projecting in one direction into the auricle, in the other into the ventricle. The pulmonary arteries, examined with great care, even in their smallest ramifications, contained no trace of clots, only dark liquid blood in abundance.

Dr. Terrillon considers the clot found in the right ventricle as the result of an embolon from the veins of the pelvis and sacral region, which were evidently in an abnormal state. The clot had the appearance and cluster of an old clot. It was gray, not white and gelatinous, like those formed in the heart at the moment of death. The bifurcation was quite distinct, and indicated that it must have come from a vein formed by the anastomosis of two smaller veins.

Is not the kind of death itself a sufficient proof that the clots, having come from some part of the venous system, had stopped in the heart? M. Charcot, who saw the specimen at the Société Anatomique, did not hesitate to say that he looked on this clot as an embolon which had stopped in the heart, and become the cause of death by impeding the action of the tricuspid valve.

Dr. Terrillon's conclusions are the following. 1. An embolon from the general venous system may stop in the heart instead of going into the pulmonary

artery, as it is generally admitted it may do. 2. It may induce sudden death by apparent syncope, but there are certain phenomena which differ from the ordinary syncope, such as cyanosis of the face and lips, swelling of the veins in the neck. The heart does not stop suddenly, but its pulsations become all at once tumultuous, small, hardly perceptible, while the pulse is thread-like. After a few minutes, the heart stops completely. 3. There is no respiratory anxiety at the moment of death, no orthopnoea, as in embolism of the pulmonary artery. On the contrary, the patient dies without any apparent struggle. 4. When death has been preceded by transitory symptoms of apparent syncope, or in the case of patients suffering from phlebitis, we may suppose that a very slender or soft clot was stopped for an instant between the chordæ tendineæ of the tricuspid valve and has given rise to those accidents.—*London Med. Record*, Aug. 15, 1878.

Diseases of the Diaphragm.

The diaphragm is a muscle the functions of which are of such importance that it is a matter of some surprise that so little attention has been paid to its diseases. With the single exception of the heart, no muscular structure of the body is in such constant action, and no muscle has so great influence on the functions of important viscera. And yet until now very few observations have been made upon its morbid states, and the student will search in vain for any important facts regarding its diseases, with the exception of a few valuable and suggestive observations recorded in our columns some ten years ago by Mr. CALLENDER. In the last number of *Virchow's Archiv*, however, is an account of some observations by Professor ZAHN, of Genth, which show how frequently it is found diseased, how varied are the morbid changes it presents, and which suggest very strongly that their influence may often be in a high degree prejudicial. It was, indeed, the observation of some cases in which slight bronchitis and emphysema, with congestion of organs, and simple, moderate dilatation of the right ventricle, seemed insufficient to account for death, but in which marked degeneration of the diaphragm coexisted, which led Zahn to study the condition of the diaphragm in other cases.

The result was the discovery that a degenerated state of the muscular fibres is by no means infrequent. The changes observed were of several kinds—simple brown atrophy, with proliferation of cells and nuclei, and granular clouding, with fatty and vitreous degeneration of the fibres. The former appears to be the more frequent, although the least important. It is not easily recognized with the naked eye, the muscular tissue appearing merely thinner than normal, and somewhat pale. The peritoneum covering it, when stripped off, has a brown colour, and between the muscular fasciculi collections of fat exist. The microscope reveals greatly degenerated fibres, lying among others nearly normal. The former have lost their striation, and contain many granules and spherules, much less numerous than those which characterize fatty degeneration, and the smaller disappearing under acids. About the nuclei are accumulations of yellowish granular pigment, sometimes separating proliferated nuclei. A peculiar protoplasm-like substance sometimes surrounds the nuclei, or lies in the muscular fibres, giving them a peculiar appearance, and in places occupying peculiar lateral bulgings of the wall, and these containing numerous nuclei. These bulgings may be so numerous as to be in contact. The proper tissue of the fibres so affected is always more or less degenerated. During two months Zahn met with no less than twenty cases in which this brown atrophy of the diaphragm was more or less marked. Almost all of the individuals presenting it were over fifty years of age; all were considerably emaciated; in most, other organs presented also simple

atrophy; and in all the muscular substance of the heart presented distinct brown atrophy. The cause of death in most was senile emphysema and bronchitis, catarrhal pneumonia, or some tubercular disease of the intestine; in one cancer of the œsophagus. In all some causes had produced a state of chronic marasmus. Zahn conjectures that the condition of the fibres may have arisen from a degeneration of the contractile element and an imperfect attempt at restorative growth in the cells of the muscle.

The granular and fatty degeneration of the diaphragm gives it, as seen through the peritoneum, a pale and somewhat opaque appearance, and when intense, minute yellowish spots may be seen among the muscular bundles. Microscopical examination shows that the degeneration affects almost all the fibres, and presents its usual appearance, the change in different fibres being, however, far from uniform. In some the granules are very fine and closely set. The muscle-cells present no proliferation in young persons, but in the old the fatty degeneration may be accompanied by cell-proliferation, with or without a deposit of pigment. Protoplasm surrounding the nuclei is, however, in this case crammed with fat-globules. This change Zahn found twice in nine cases, each individual being over eighty years of age. Callender recorded¹ six cases of fatty degeneration found in subjects of various ages. In all it was associated with marked fatty degeneration of the heart, while the other voluntary muscles were healthy. To these cases Zahn adds nine others, five over fifty, and four under forty. All presented the traces of more or less bronchitis and emphysema, and some, croupous pneumonia. In the latter cases there was no fatty degeneration of the heart, but in all the others the heart and the diaphragm presented the same change. Putting together Callender's and Zahn's cases, we have ten men and five women, and thus the affection appears to be more frequent in the male sex.

The third form of change—the waxy or vitreous degeneration of the fibres—Zahn has found in one case only, a middle-aged man who suffered from chronic alcoholism, and died of pneumonia. To the naked eye, the diaphragm was normal, but under the microscope many fibres presented the change in its most characteristic form, while others were in a state of commencing fatty degeneration. No similar degenerations could be found in the heart or other muscles, but the liver was fatty.

The correlation of these changes with clinical symptoms has yet, in a great measure, to be made. One of the most important clinical facts is the great frequency with which degenerations of the diaphragm and of the heart coincide. The changes in the two muscles are similar in character, and occur for the most part at a time when muscular tissue elsewhere in the body is normal. The two structures have certain common physiological conditions. From birth to death they are in almost uninterrupted work, and each appears to suffer at the same time from the same general cause; and it may well be that the increased work which chronic bronchitis and emphysema throw upon the diaphragm and heart may lead, in some cases, to the occurrence of the simultaneous degeneration of the two structures, since in the heart the change is found most intense in that portion of the heart on which the greatest work falls—the right side. An explanation of the origin of the degeneration in acute lung diseases, in which commonly the heart is unaffected, is less obvious. All the conditions of muscular over-action tend, however, to produce hypertrophy, as well as, and even more than, degeneration. Whether in these cases the muscular tissue of the diaphragm is increased in quantity is a question that must be left for the present uncertain. The symptoms and consequences to which the degenerations give rise must also

¹ The Lancet, 1867.

be ascertained by further observation. In many of the cases intense dyspnoea had existed during life, but there were in all other conditions to which this symptom might be, in part at least, ascribed. Virchow long ago pointed out that atrophy of the diaphragm increases greatly the effect of asphyxiating causes, and may determine the fatality of the least bronchial catarrh. Whether, however, we may suggest, this is true in cases in which the diaphragm alone is affected, the intercostals being normal, is a point on which further observation is necessary, and on which the phenomena of some cases of paralysis of the diaphragm throw some doubt. The point suggests, however, the desirability of a more careful examination than hitherto has been made into the condition of the intercostal muscles in other cases. This is also important as regards the question of pathogenesis, since, if overwork plays a potent part in the production of this change, the intercostals should suffer in due proportion in the same cases.—*Lancet*, Aug. 17, 1878.

Paracotoin in Cholera.

Dr. BALZ of Tokio in Japan (*Centralblatt für die Medicin Wissenschaften*) has given paracotoin with uniformly good result in five cases of cholera during a recent epidemic; his supply then becoming exhausted. It was used in subcutaneous injection in doses of 2 decigrammes (3 grains) dissolved in equal parts of glycerine and distilled water. The Japanese government has decided on the extended use of the remedy, if an epidemic of the disease should again break out. The following brief account of a cure speaks, in the author's opinion, in favour of paracotoin as a remedy of very high value in the treatment of cholera—perhaps the most valuable with which we are acquainted.

M., a strong young woman aged 22, when seen four hours after the commencement of her illness, was in a very apathetic condition, with cold extremities and thready pulse. She vomited frequently, and passed rice-water motions involuntarily. At 4 P. M., 2 decigrammes of paracotoin, dissolved (or rather suspended) in equal parts of water and glycerine, were injected subcutaneously; the vomiting at once ceased. At 5.30 she had a liquid stool; 3 grains of paracotoin were given internally. All the symptoms improved, and the pulse became stronger and regular; the extremities (under the simultaneous continued use of warm clothes, etc.) became warm; the cyanosis disappeared. Five grammes of cognac were given every quarter of an hour. Paracotoin was again injected subcutaneously at midnight; and, an hour afterwards, there was profuse sweating. The next day the patient was very weak, but in other respects quite well.—*London Med. Record*, August 15, 1878.

The Diagnosis and Treatment of Intestinal Obstruction.

At the late meeting of the British Medical Association (*British Med. Journal*, Aug. 31, 1878), Mr. JONATHAN HUTCHINSON read a paper on this subject, and presented for criticism the following

Memoranda for Diagnosis.—1. When a *child* becomes suddenly the subject of symptoms of bowel obstruction, it is probably either intussusception or peritonitis.

2. When an *elderly person* is the patient, the diagnosis will generally rest between impaction of intestinal contents and malignant disease (stricture or tumour).

3. In *middle age*, the causes of obstruction may be various; but intussusception and malignant disease, both of them common at the extremes, are now very unusual.

4. Intussusception cases may be known by the frequent straining, the passage

of blood and mucus, the incompleteness of the constipation, and the discovery of a sausage-like tumour, either by examination *per anum* or through the abdominal walls.

5. In intussusception, the parietes usually remain lax, and, there being but little tympanites, it is almost always possible, without much difficulty, to discover the lump (or sausage-like tumour) by manipulation under ether.

6. Malignant stricture may be suspected when, in an old person, continued abdominal uneasiness and repeated attacks of temporary constipation have preceded the illness. It is to be noted also that the constipation is often not complete.

7. If a tumour be present and pressing on the bowel, it ought to be discoverable by palpation, under ether, through the abdominal walls or by examination by the anus or vagina, great care being taken not to be misled by scybalous masses.

8. If repeated attacks of dangerous obstruction have occurred with long intervals of perfect health, it may be suspected that the patient is the subject of a congenital diverticulum, or has bands of adhesion, or that some part of the intestine is pouched and liable to twist.

9. If, in the early part of a case, the abdomen become distended and hard, it is almost certain that there is peritonitis.

10. If the intestines continue to roll about visibly, it is almost certain that there is no peritonitis. This symptom occurs chiefly in emaciated subjects, with obstruction in the colon of long duration.

11. The tendency to vomit will usually be relative with three conditions and proportionate to them. These are (1) the nearness of the impediment to the stomach, (2) the tightness of the constriction, and (3) the persistence or otherwise with which food and medicine have been given by the mouth.

12. In cases of obstruction in the colon or rectum, sickness is often wholly absent.

13. Violent retching and bile-vomiting are often more troublesome in cases of gall-stones or renal calculus simulating obstruction than in true conditions of the latter.

14. Fecal vomiting can occur only when the obstruction is moderately low down. If it happen early in the case, it is a most serious symptom, as implying tightness of constriction.

15. The introduction of the hand into the rectum, as recommended by Simon of Heidelberg, may often furnish useful information.

Memoranda for Treatment.—1. In all early stages, and in all acute cases, abstain entirely from giving either food or medicine by the mouth.

2. Use anæsthetics promptly. Put the patient under the full influence of ether; examine the abdomen and rectum carefully before tympanites has concealed the conditions; administer large enemata in the inverted position of body; and, if advisable, practise abdominal taxis. If you do not succeed at first, do it repeatedly.

3. Copious enemata, aided perhaps by the long tube, are advisable in almost all cases, and in most should be frequently repeated.

4. Fluid injections may be sometimes replaced by insufflation of air in cases of invagination, since air finds its way upwards better, and is more easily retained. It is, however, somewhat dangerous, and has, perhaps, no advantages over injections with the trunk inverted.

5. Insufflation is to be avoided in all cases of suspected stricture, since the air may be forced above the stricture, and there retained.

6. Saline laxatives are admissible in certain cases where impaction of feces is suspected, and in cases of stricture where fluidity of feces is advisable.

7. Opium (or morphia) must be used in proportion to the pain which the patient suffers. It should be administered by the rectum or hypodermically, and should be combined with belladonna. If there be not much pain or shock, it is better avoided, since it increases constipation and may mask the symptoms.

8. A full dose of opium administered hypodermically will put a patient in a favourable condition for bearing a prolonged examination under ether, and attempts at abdominal taxis.

9. In cases of uncertain diagnosis, it is better to trust to the chance of spontaneous cure of relief by repeated abdominal taxis, than to resort to exploratory operation; or, in desperate cases, iliac enterotomy should be done. Operations for the formation of an artificial anus in the right or left loin may be performed whenever the diagnosis of incurable obstructive disease in the lower bowel is made.

10. The operation for the formation of an artificial anus through the anterior part of the abdominal wall and into the small intestine should be resorted to only in certain cases of insuperable obstruction, in which the seat of disease is believed to be above the cæcum.

11. In all cases in which the precise seat of disease is doubtful, but the large intestine is suspected, the *right* loin should be preferred. If the colon here be found to be empty, the peritoneum may be cautiously opened and a coil of distended small intestine brought into the wound.

12. My last suggestion as to treatment is one which, speaking as I do in a Medical Section, I feel some delicacy in making. It is, however, I believe, a very important one, and it is this, that cases of mechanical obstruction are really surgical and not medical cases. They require manipulative measures both for diagnosis and for treatment, and they require them early. It is difficult to explain why it has come about that, as a rule, a physician is called in first, and nothing but drug treatment usually adopted in the early periods, and it is, I am convinced, much to be regretted. The surgeon is but too often asked to see the case only in the last stage, when it is thought that perhaps an operation may be desirable. At this period the abdomen is distended, and an accurate diagnosis impracticable; but, what is worse, the stage at which abdominal taxis is most hopeful has passed. My remarks do not, of course, apply when the medical attendant possesses the knowledge and exercises the functions of both branches.

Mr. Hutchinson submitted, as a most important proposition, *that, in the present state of surgical knowledge, exploratory operations for the relief of abdominal obstruction, the cause of which cannot be diagnosed, are not warrantable.* Operations performed at the hernial regions, in search, it may be, for suspected *réduction en masse*, are, of course, quite outside this rule. It refers only to opening the abdomen in the middle, with the intent to introduce the hand and search for the obstructed part.

If, however, we turn to certain cases in which the precise cause of obstruction is definitely diagnosed, then a very different decision must be arrived at. In cases of invagination, when the included tract is long and when other measures have been exhausted, abdominal section is probably the best method of treatment. Here the surgeon knows what he is going to attempt, and that in the majority of cases it can be easily accomplished. The operation is justifiable at a comparatively early stage, when there is not much risk of rupture of the bowel, and but little difficulty may be expected in getting the contents back into the abdomen. Yet even here the operator encounters the discouragement of knowing that nature is competent to the cure by sphacelus of some of the most desperate forms of intussusception, and it is not yet settled whether leaving them to this chance involves less or more risk than operating. My own opinion is, however, definite; and in

any such case, enemata, insufflation, and other measures having had patient and repeated trials, I should not hesitate to open the abdomen. I have done this in two cases, and in one of them with perfect success; and successful cases have also been recorded by Mr. Howard Marsh, Mr. Howse, and other surgeons. In the peculiar form of intussusception beginning at the cæum and advancing until the inverted ileo-cæcal valve presents at the child's anus, I should suspect that an operation will always be required, for I know of no reliable record of the recovery of such a case either by gangrene or by the measures to which we may apply the name of rectal taxis.¹

Myositis Ossificans.

At the Vienna Medical Society, Docent Dr. NICOLADONI (*Allg. Wien. Med. Zeit.*, May 28) presented a girl, seven years of age, as an example of a very rare affection of the muscles, viz., ossification of the muscles of the trunk and limbs. The disease had been going on for about a year, commencing in the muscles of the neck, whence it extended to the spine, the anterior part of the thorax, and the limbs. On each side of the spine a rigid line (sacro-spinales) extends. The scapula is fixed to the thorax; and in the cervical regions are found fibrous cords containing bony plates. The right knee-joint is contracted, and the pectorales are almost entirely ossified. There are only three similar cases on record.—*Med. Times and Gaz.*, June 22, 1878.

A New Parasitic Disease of the Hair.

Under the name of "Piedra," a parasitic disease of the hair, supposed to be a previously-known affection, has been described to the Académie des Sciences by M. DESENNE. It has been met with in Columbia, in the natives of the province of Cauca. It consists in small nodosities, visible to the naked eye, and as hard as stone, resisting and even turning the edge of a scalpel. The hair, treated with ether and mounted in glycerine, presents the following appearance under a magnifying power of 140 diameters. The nodules are placed at a tolerably regular distance apart, without being arranged with any mathematical exactness. They are of two kinds, some surrounding the hair completely, like a fusiform ring, others surrounding it incompletely, or forming nodules on one side. This difference may be explained by a different degree of maturity of the fungus constituting them. Under a higher magnifying power they are seen to consist of a cellular mass of polygonal elements .102 to .105 millimetre in diameter, and regularly arranged, their intervals being indicated only by a black line. These cells have strongly refracting cells, but no nuclei. Adjacent to one of these nodosities a network could be seen consisting of little rods articulated one to another, and extending around the hair, just as ivy surrounds a column. Some of these rods appeared to blend with the proper substance of the nodosity, others terminated at some distance, either by an ampulliform swelling or umbellate extremity. Are these rods the mycelium of the fungus which forms the cellular mass of the nodule, or are they independent of the latter? The question is difficult to answer, since enough hairs could not be obtained to settle it by experiment; but it was evident the rods were merely in juxtaposition at the periphery of the hair. Nowhere in the substance of the hair could any trace of a vegetable parasite be discovered after the action of liquor potassæ or acetic acid, and the integrity of the medullary canal and its environment was evident on a transverse section through one of the nodules. The interior of the nodules was composed of a cellular stroma simi-

¹ My opinions on this subject will be found in detail in two papers in the *Medico-Chirurgical Transactions*.

lar to that covering the periphery, and on it were some large cavities containing one or two large uncoloured cells, probably three. Similar empty cavities could be seen at certain points in the substance of the nodosity, and had apparently been of the same nature, and become inclosed by the layer of polygonal cells.—*Lancet*, August 3, 1878.

SURGERY.

Septic and Aseptic Wound-Fevers.

One difference between cases of surgical operation and of injuries treated antiseptically and those treated by the old methods is, that in a large proportion of the former, if successfully managed, there is no rise of temperature whatever, even though the extent of wound be such that under ordinary circumstances the fever would be sufficiently severe to cause death. On the other hand, fever, and even considerable elevation of temperature, may occur in cases where the wounds have apparently been treated with all the precautions of antiseptic surgery. The fever, however, which is met with where the antiseptic method has been employed, is remarkable for the slight constitutional disturbance with which it is accompanied. The elevation of temperature is almost the only, or at any rate the only remarkable, clinical symptom. In spite of their fever, the patients scarcely feel ill. This peculiarity of the fever accompanying antiseptic wounds has been carefully studied for several years, in Professor VOLKMANN's clinic at Halle, by himself and Dr. ALFRED GENZMER, and they have summed up the conclusions which they have already arrived at in No. 121 of the *Sammlung Klinischer Vorträge*.

To the fever which accompanies ordinary wounds they give the name of "septic," and to that which may or may not be present in wounds treated antiseptically, according to the rules laid down by Professor Lister, that of "aseptic" wound-fever. Out of a thousand cases of severe injury or severe operations treated with complete success by the antiseptic method, about one-third will recover, roughly speaking, without any fever at all, one-third will have moderate fever, and one-third high fever. At first the occurrence of fever under the antiseptic treatment was considered by Volkmann to be due to some defect in the management of the dressing, but careful observation of a large number of patients showed that after all those cases in which the fever could be explained by the occurrence of small abscesses in the neighbourhood of the sutures, by imperfect drainage, by sloughing of the edges of the wound, by carbolic-acid eruptions, by individual susceptibility to the contact of the air, and by other causes (all of which clearly gave rise to transient septic infection of the mildest character), there still remained a large number of patients who had more or less severe, and more or less protracted, fever, while the progress of the wound was completely normal, without redness, swelling, purulent discharge, or the least deviation from the typical course of an antiseptically-treated wound.

The remarkable thing about aseptic fever is its complete apparent independence of the condition of the wound. A patient may have a temperature ranging from 39.5° to 40.5° Cent. (103.1° to 104.9° Fahr.) for a week or ten days, and yet appear perfectly well; in fact, he may be able, as is frequently the case at Halle after wounds or operations on the upper extremities, to walk two or three miles from his home in the country every day to the hospital to have the dressing changed. In aseptic fever, even with the highest temperatures, Volkmann and Genzmer never found the tongue dry, though there was often increased thirst.

The skin never felt so hot to the touch as it was proved to be by the thermometer, and it was always moist, and not dry. Profuse sweats were not unfrequent. The urine was secreted in remarkable abundance, and the appetite of the patient was but little, if at all, affected. There was scarcely any decrease in the excretion of chlorides; on the other hand, urea was abundantly excreted, the amount being apparently proportional to the intensity of the fever. The average relation between chlorides and urea in aseptic fever was found to be as 1 : 2 — 3, and in septic fever as 1 : 10 — 18. There was usually rather a tendency to looseness of the bowels than to constipation. In spite of the fever the patients lost very little flesh or strength. The frequency of the pulse corresponded in general terms to the height of the fever, just as in the septic form, but its volume was never so small, nor its tension so marked, as it often is in the latter.

The pure form of aseptic fever is characterized by Volkmann and Genzmer as "harmless and without prognostic significance." Of course between these cases of pure aseptic fever and the cases of ordinary septic fever there are numerous transitional forms, which depend most probably on the imperfection of the present antiseptic method, by which the development of specific processes of decomposition in the secretions of the wound is not always completely prevented. The final issue of such cases depends on the predominance of the septic or aseptic element.

Cases of pure aseptic fever are rare under the old method of dressing wounds, though they do occur; on the other hand, well-marked aseptic fever is not uncommon, according to Volkmann, in cases of subcutaneous injury, severe contusions of joints, and especially in subcutaneous fractures of bones. Thus, out of fourteen cases of simple fracture of the thigh recently admitted into Volkmann's clinic, all but three were accompanied with fever ranging from 38.9° to 40° Cent. On the other hand, in only a half of a number of cases of simple fracture of the leg was there any elevation of temperature. The smaller proportion of febrile cases in the latter category is explained by Volkmann to depend on the different mode of treatment of the two kinds of fractures in his clinic, fractures of the leg being either put up in plaster of Paris or in splints, whereas fractures of the thigh are invariably treated by extension with weights, so that in the former case there is less opportunity for local irritation or reaction than in the latter.

But not only are subcutaneous fractures not invariably, as some authorities have asserted, afebrile in their course, but the fever which accompanies them is not always purely aseptic in its character. Volkmann and Genzmer have noticed this especially in fractures of the neck of the femur, and they ask whether the high temperature and the general septic character of the symptoms depend in these cases on inflammatory complications which have been overlooked in internal organs, or to an unusual development of poisonous exudations between the surfaces of the fractured bone. Anyhow, with these facts before us it would be unfair to demand that patients with open wounds submitted to antiseptic treatment should exhibit *no* elevation of temperature in the early days of the healing process.

The theoretical explanation of the peculiar behaviour of aseptic wound-fever we shall give in the words of its authors: "Aseptic wound-fever," they say, "is after all, in our opinion, nothing but a fever due to absorption, but it differs from septic fever in this respect, that the substances absorbed are not so very different from those which are produced by the retrograde metamorphosis of the tissues, and the various nutritive processes which occur physiologically in the body; whereas, in septic fever, heterologous, poisonous, and putrid bodies or fluids which contain some specific element or other, capable of exciting processes of decomposition, find their way into the blood. The knowledge which has been obtained by experiments on transfusion, and even on autotransfusion, prevents

our doubting for a single moment that such substances as we have supposed to have given rise to aseptic fever are capable of producing large elevations of the temperature of the blood."

In the repair of all, even of subcutaneous injuries, large portions of tissue must be decomposed and absorbed, and, as a fact, aseptic fever most often occurs, and is highest and most protracted, in the antiseptic treatment of contused and lacerated wounds, and after operations resulting in an excessively large breach of surface. It is a strong argument in favour of the above view of aseptic fever as an absorption-fever that Volkmann and Genzmer have almost invariably succeeded in rendering the most severe operations and injuries afebrile by means of permanent antiseptic irrigation, combined with abundant drainage of the deepest parts of the wound, so that the secretions which form between the sides of the wound in the first few days after operation are continually washed away. In concluding their observations, which they frankly admit to be provisional in character, the authors point out that one result of their researches must be to prevent a great part of the clinical symptoms of fever being referred so exclusively to the rise in the temperature of the blood as has lately been so much the fashion. The use of the thermometer *per se* gives very uncertain indications in antiseptic patients when we wish to determine whether danger is to be apprehended from their wounds, while, on the other hand, careful observation on the *general* condition of the system is of the highest importance.—*Med. Times and Gaz.*, June 22, 1878.

Occurrence of a Pustular Eruption in Pyæmic Cases.

Mr. H. C. CAMERON relates (in the *Lancet*, July, 1878, p. 65) two cases of this apparently rare complication in pyæmic cases. A young woman was admitted into hospital, with well-marked anthrax of the lower lip, on October 10, 1876, and died October 12. On admission, there were no cutaneous symptoms; but, on the 11th, the body and extremities were covered with sudamina, and numerous small purpuric spots, that did not disappear on pressure. Very soon the sudamina became purulent.

In another case, admitted on May 3d, 1877, a young girl, aged ten, had the great toe severely crushed three weeks previously. Acute peritonitis followed. Over the whole surface of the body an eruption, precisely similar to that in the previous case, existed, which quickly became pustular; and, before her death, the body was covered with pustules of very considerable size. Dr. Foulis, who conducted the *post-mortem* examination in each case, was of opinion that the pustular eruption was due to capillary cutaneous injections.

[This pustular eruption and purpuric exanthem accompanying pyæmia are ably treated by an anonymous contributor in the *Gazette Hebdomadaire*, No. 46, 1868. The conclusions at which he arrives are these: 1. In cases of pyæmia, the skin becomes the seat of various exanthematous eruptions. 2. This symptom is rare, if one may judge from the silence of authors; it is the *avant courier* of approaching death. The late Dr. Anstie reported in the *Lancet*, January, 1870, p. 117, a singular case of spontaneous pyæmia occurring in a scullerymaid aged twenty, admitted Sept. 10th, 1869, with pain in her joints, that had existed several days. Temperature 101° Fahr. Sept. 12th. On the right side of her face were a couple of red spots. On the 13th, over the face and body were a number of bullæ and pustules in various stages. Temperature 104°. The left knee was much swollen, also the dorsum of the right hand. On Sept. 14th, the pustules and bullæ were still more numerous. Death occurred at 5 P. M. The *post-mortem* examination threw no light upon the origin of the pyæmia, which, Dr. Anstie thought, must have arisen from the foul atmosphere in which the patient lived.—*Rep.*—*London Med. Record*, Aug. 15, 1878.]

Cancer.

In a paper on cancer read at the Congress of the Society of German Surgeons in 1877, and subsequently published in von Langenbeck's *Archiv für Klinische Chirurgie*, Band xxii, Heft 2, Professor ESMARCH presented several aphorisms on the clinical history of cancerous disease. After a statement of the well-recognized fact that the terms "cancer" and "malignant growth" are no longer synonymous, the author points out that growths which usually take a benign course may occasionally present an undoubted malignant character. This change may occur in enchondroma, fibroma, and fatty tumors; and, as has been recently shown by Cohnheim, a cystic bronchocele may acquire a malignancy equal in intensity to that of typical sarcoma and carcinoma. Most surgeons of experience have had opportunities of observing cases in which there had been a speedy cancerous degeneration of a long-standing wart on the face of an old person. Of less frequent occurrence, however, although the author has seen four instances of this, is the rapid conversion into a malignant tumour of a simple atheroma of the scalp, a form of new growth commonly regarded as most benign. Cases of this kind were reported by Dieffenbach and Wernher. In some remarks bearing on the clinical facts that lingual and buccal psoriasis is frequently converted into a cancerous ulcer, and that old scars, especially those formed after lupoid ulceration, frequently undergo cancerous degeneration, the author puts the question, whereby and under what conditions do benign new growths and cicatrices take on a malignant character? It is well known that the repeated action on a soft structure of some irritating body may be followed by the appearance of a cancerous growth, and there can be no doubt that the prolonged or frequently renewed contact of tobacco-juice, soot, and paraffin may give rise to canceroid of the skin. In the great majority of cases of cancer, however, no evidence can be obtained of the previous action of any irritant, and so one is led to inquire whether the malignant disease may not be due to some constitutional anomaly or dyscrasia. Dr. Esmarch seems disposed to hold that the inherited dyscrasia of scrofula and syphilis may create a tendency to malignant new growth. Such an association, however, it is granted, cannot be made out save by the exercise of much patience, and the expenditure of much time in obtaining complete clinical histories. It is stated by the author that many undoubtedly malignant tumours may be cured by operation, provided the surgeon interfere early, and the growth be radically removed. Unfortunately, in too many cases the operation is not performed until a late period, and when many other and milder methods of treatment have been tried. In most of these cases the blame, the author holds, rests with the patient.

In discussing the treatment of cases of advanced cancer in which surgical operation is hopeless, Professor Esmarch states that, in his opinion, arsenic is a very efficient agent, and one that may be used, internally as well as externally, with the best effect. The practice is recommended of giving Fowler's solution after removal of a cancerous growth, in order to prevent relapse. The employment of this agent is naturally suggested by what we know as to the nature of cancer. Arsenic certainly acts beneficially on certain affections of the epidermis, and cancer may be strictly regarded as an excessive overgrowth of epithelium. It is necessary in desperate cases of cancer to administer arsenic in rapidly increased and finally heroic doses. The good results recently obtained by Billroth and others from the employment, both internal and external, of arsenic in cases of malignant lymphoma, show that growths not of an epithelial structure may also be cured by this agent, good results from the use of which have also been gained in the treatment of cases of lympho-sarcoma.

Dr. Esmarch has repeatedly applied electrolysis for the destruction of cancer-

ous growths which could not be totally removed by operation, but in only one case with any marked success. Canquoin's paste acts very efficiently on the removal of new growths, but a great objection to the use of this compound is the pain it creates, which is very severe, and but partially relievable by morphia.

In some remarks on a reported case of relapsing sarcomatous tumour, treated successfully by the use, both internal and external, of iodine, Dr. Esmarch suggests that many malignant new growths, especially those which improve on the administration, in large doses, of tincture of iodine, may be associated with inherited or acquired syphilis. There are many clinical and pathological facts that indicate such an association. All pathologists agree that it is very difficult to distinguish histologically between the products of tertiary syphilis, the so-called gummata, or syphilomata, and sarcomatous new growths. The small-celled infiltration of the tissues of the nose, described by Hebra under the name of rhinoscleroma, which stands midway between chronic inflammatory proliferation and malignant new growth is frequently associated with long-standing syphilis. It is well known, also, that buccal and lingual psoriasis, which so often terminates in cancer of the tongue, has frequently a syphilitic origin. It is acknowledged, however, that a product of advanced syphilis or of scrofulosis is frequently mistaken for a malignant new-growth, and that even by many an experienced surgeon an ulcerated gumma or a tubercular ulcer of the tongue has been excised as a lingual cancer, a syphilitic ulcer of the lip as a labial cancer, and syphilitic growths from the mucous membrane of the rectum as rectal cancer. Mistakes of this kind are more likely to occur, as it is not generally known that ulcerating gummata may be met long after the date of the primary affection, and without the appearance during the interval of any secondary symptoms.

In consequence of the probability of such errors, Dr. Esmarch has made it a rule in his practice never to extirpate a morbid growth before having made out its structure and nature by microscopical examination. For this purpose, a very small piece removed from the surface of the growth or from its central part by means of a proper instrument, will suffice. When there is an indication of having to perform an important and dangerous cutting operation for the removal of a new growth, the surgeon need not hesitate to carry out this very minor and safe preliminary measure.—*London Med. Record*, Aug. 15, 1878.

Chloroma.

An example of the rare form of sarcoma which, from its tint, has been designated "chloroma," has been recorded by HUBER in the *Archiv der Heilkunde*. It occurred in a girl, aged twenty-one years, the primary growth being in the mamma. Death occurred in consequence of the widespread secondary development of the growths, seven months only after the appearance of the primary mammary tumour, which was extirpated. At the autopsy secondary growths were found in the periosteum of the orbit, the frontal and occipital bones, and in the other mamma. All the tumours presented, on section, a yellowish-green tint, here and there bluish-green, mottled by paler tracts. The enlarged bronchial glands, and the pus which came from the wound left after the extirpation of the mamma, had the same colour. The structure of the tumours was that of a round-celled sarcoma, through which passed tracts of a spindle-celled tissue. The tint was pale in thin sections, and was due to coloured granules or drops, which were regarded as neither albumen nor simple fat, but, it was conjectured from the reactions, consisted of a compound of a fatty acid with some organic or inorganic substance. The periosteal position of these growths is characteristic of the variety.—*Lancet*, Aug. 3, 1878.

Extirpation of the Larynx; Artificial Vocal Apparatus.

Dr. GEORGE WEGNER (Berlin) described, at the late Congress of the Society of German Surgeons, the case of a woman, aged 52, who was operated on in September of last year. Tracheotomy was first performed on account of severe dyspnœa; and, the presence of cancer having been detected by laryngoscopic examination, the whole larynx was removed, along with the epiglottis. The patient was now in good health, and showed no signs of a return of the disease. She had used Gussenbauer's artificial vocal apparatus occasionally, and had spoken distinctly with it. She could, however, wear it for only short times, as, in consequence of the fauces being imperfectly shut off from the trachea, portions of food and mucus readily passed into the latter, and interfered with the play of the metallic tongue. The cause of this was probably the removal of the epiglottis, from which proceeding Dr. Wegner would abstain in any subsequent similar operation, unless it were found to be indispensable.

Dr. Wegner then showed the action of an artificial vocal apparatus on a girl aged 11, who, at the age of seven, had an attack of diphtheria, which was followed by cicatricial closure of the trachea and complete destruction of the vocal cords. When she was admitted to hospital she wore a tracheal tube, and was quite voiceless. By means of laryngotomy and the use of bougies, the laryngeal passage was made pervious. Dr. Wegner supplied her with an apparatus, which differed from Gussenbauer's in the absence of the tongue-shaped epiglottis, and further, in the circumstance that the voice-tube was introduced first, and then the tracheal tube. With this apparatus she could speak easily and distinctly.—*London Med. Record*, June 15, 1878.

Gunshot Wound of the Chest; Resection of the Clavicle and Five Ribs.

Dr. SCHNEIDER (Königsberg) related the following case at the late Congress of the Society of German Surgeons: On October 10th of last year, O. H., aged 21, attempted to commit suicide by discharging a pocket-pistol loaded with two bullets into his chest, on the left side of the sternum, above the third rib. The opening was four-fifths of an inch in diameter; and there was much laceration of the lung. As sufficient care was not taken to use disinfectants, the effused blood underwent putrefaction, and the hæmato-pneumothorax produced by the wound became converted into an ichorous hæmato-pyo-pneumothorax. There was also sloughing of the injured lung. Septic infection was thus produced, and the patient became pyæmic; rigors appeared on the fourth day after the injury. On October 20, the patient came under Dr. Schneider's care. Thoracentesis was first performed, and a quantity of thin highly offensive fluid was removed from the left pleural cavity; an incision $1\frac{1}{2}$ inch long was made between the seventh and eighth ribs. A splinter of the third rib was removed, and the pleural cavity was thoroughly washed out with a solution of carbolic acid ($2\frac{1}{2}$ per cent.). Through the opening of entrance—which had become much widened—there could be seen the pericardium covering the upper part of the heart, the contraction of the auricles, and the pulsation of the great vessels. As far as the lung could be seen, it was everywhere sloughing; the greater part of the upper lobe was wanting. The subsequent treatment consisted of diligent washing out of the thoracic cavity; the insertion of a silver canula where the incision had been made; and dressing with carbolized jute. For some days the rigors continued, and the patient's appetite was bad. In consequence of further sloughing of the lung, the posterior wall of the thorax was exposed, and the bullets were detected in it. On moving one of them with a probe, it fell into the thoracic cavity on to the diaphragm, and during the night the other bullet also fell. Chloroform having

been administered, the patient was placed on his side, and, the finger having been introduced into the incision-wound, both bullets were hooked out; they lay on the diaphragm. The paper wadding, which had become infiltrated with sanious matter, was also soon afterwards removed. Early in November the necrosis of the lung was arrested, and the patient was free from fever. The remains of the lung gradually contracted towards the hilus; it had a very hard feel, and was connected with firm cicatricial masses of connective tissue. The aperture of entrance of the bullets had contracted to a length of $3\frac{1}{2}$ inches and a breadth of $1\frac{3}{8}$ inch. As there was no trace of diminution of the right pleural cavity to correspond with the destruction of a large portion of the lung, and as the patient's strength was failing daily, Dr. Schneider, on December 8th, excised from the second rib 5, from the fourth $9\frac{1}{2}$, from the fifth $9\frac{1}{2}$, and from the sixth 11 centimetres (2. 3.8. 3.8. and 4.4 inches) at the junction with the cartilages. This extensive resection was not followed by the result which was expected. A week later the lower part of the thoracic cavity began to contract, but the portion above the third rib (where there was no trace of lung) remained unchanged. On Jan. 15th, Dr. Schneider removed (by subperiosteal section, as in all the other incisions) a piece of the clavicle an inch and a half long; by which the left shoulder was approximated to the sternum, and the soft parts in the infraclavicular region were drawn more toward the thoracic cavity. The result was successful. The soft parts in the cavity contracted, the upper part of the pericardium with the great vessels retreated towards the left, and the upper part of the left pleural cavity, which before the resection easily admitted three fingers, at the beginning of March allowed only room for a moderately thick bougie. At the end of March, the whole left pleural cavity was obliterated, and the situation of the aperture of entrance was occupied by a funnel-shaped cicatrix, and a small superficial wound. The resection-wounds healed by the first intention. There was a slight osseous deposit at the parts where the ribs had been excised, and much on the clavicle. The left arm was freely movable, but somewhat limited in function as compared with the right arm. The left clavicle retained its position; the scapula had somewhat sunk; there was no trace of scoliosis. The heart lay almost entirely in the left half of the chest; the apex-beat, which was strong, was perceived in the fifth intercostal space, two centimetres outside the nipple. Cardiac pulsations could be distinctly seen where the third, fourth, and fifth ribs had been excised.

Dr. Bardeleben said that such cases showed how much man could bear. At Gitschin a splinter of shell had torn away the left side of a man's chest, and his left elbow was also crushed. Tetanus occurred among the wounded; and this man alone recovered, resection of his elbow having been performed.—*London Medical Record*, June 15, 1878.

Gastrotomy.

A case of cancerous ulceration of the œsophagus, in which it was found necessary to open the stomach, is reported by Dr. OTTO RISEL of Halle in the *Deutsche Medicinische Wochenschrift*, of May 4th. The patient was a strong, well-nourished, and slightly pale man, aged fifty-two years, who for some few weeks before he came under the author's notice had suffered from difficulty in swallowing, and complained of inability to pass into the stomach any solid food. There had not been any vomiting; the patient had not felt any pain, but had been much troubled with accumulation of mucus in the throat. The seat of the obstruction in the gullet was referred by the patient to a point behind the lower portion of the sternum. Behind the tendon of the left sterno-mastoid muscle, just above the corresponding sterno-clavicular articulation, could be felt a firm, immovable

tumour of about the size of a pigeon's egg. This was smooth over its anterior surface, did not fluctuate, and was not painful. The œsophageal sound could be passed almost as far as the stomach, but near the cardia was arrested by a constriction, through which, on slight pressure, the olivary extremity of the smallest tube could be forced. During a period of one month after he had been first seen by Dr. Otto Risel, the patient derived much benefit from the frequently repeated introduction of the œsophageal sound. There was diminishing difficulty in swallowing, and a marked increase in the strength and general condition. After this period, however, the improvement rapidly ceased, and the œsophageal constriction increased to such an extent as to prevent the introduction into the stomach of the smallest sound. In the course of the next three weeks there were febrile paroxysms, with signs of infiltration of the base of the right lung. The patient became much emaciated, had difficulty in swallowing fluid as well as solid food, and was much troubled by a violent straining cough, with much expectoration of thick and occasionally blood-stained mucus. Attempts at passing the smallest sound through the obstruction in the gullet caused intense pain. There was dullness over the back of the chest on the right side, and crepitation, fine or coarse, was heard over all parts of the corresponding lung. Hence it was concluded that there had been perforation of the œsophagus, and subsequent outpouring of food into a parœsophageal cavity just above the origin of the diaphragm. As attempts to feed the patient by the rectum were attended by almost negative results, gastrotomy was performed by Dr. Risel on November 9th of last year. An incision having been made under carbolic acid spray in the anterior abdominal wall, the anterior surface of the stomach was found without much difficulty, and then, after having been dragged forwards, was incised and fixed to the edges of the external wound. Near the cardiac region of the organ was found a small, hard, tuberculated tumour, which was regarded as a cancerous gland. In consequence of the frequent and violent fits of coughing, no attempt was made to pass food into the stomach until the third day. On the seventh day, the patient died from exhaustion, in a state of collapse. At the necropsy, the edges of the gastric and external orifices were found to be firmly glued together. Beyond this region there were no traces of peritonitis. At the posterior portion of the base of the right lung was a small cavity communicating with a dilated bronchus, and containing a brownish semi-fluid mass. The lower half of the wall of the œsophagus presented a large ulcer commencing about two centimetres above the cardiac extremity of the stomach, and extending upwards over an extent of about nine centimetres. The edges of this ulcer were hard, notched, and elevated, its base was gray and sloughy, and in its midst was a large orifice communicating with the above-mentioned cavity at the base of the right lung, the surface of which organ in this region was closely adherent to the right wall of the œsophagus and to the vertebral column.

Dr. Risel, in his remarks on this case, points out that, as was proved beyond doubt by the necropsy, death was the result of exhaustion and not of the operation. The peritonitis had been purely adhesive and limited to the immediate neighbourhood of the wound. The adhesions between the margins of the gastric and those of the external wound were firm and had not been disturbed by the violent fits of coughing. In seeking for the stomach through the wound in the abdominal wall, the best guide, it is stated, is the under surface of the liver, and the hollow viscus may be readily recognized by the thickness of its coat, the absence of longitudinal bands of muscle, and the arrangement of its vessels, the veins being much more conspicuous than the arteries, along the greater and lesser curvatures. In cases where it is required to open the stomach as near as possible to the centre of its long axis, the best external incision is one made parallel and

about a finger's breadth internal to the margin of the left osseous wall of the thorax. When the organ has to be opened near its pyloric extremity, the incision in the abdominal wall should be made nearer to the middle line.—*London Med. Record*, June 15, 1878.

Cholecystotomy in Dropsy of the Gall-Bladder.

Since Mr. Maunder recommended this operation in cases of impacted gall-stones (*Lancet*, vol. ii., 1876, p. 640), at a meeting of the Clinical Society, when the feasibility of such a procedure was discussed in relation to a case that had been under Dr. Daly's care, no operator has been found bold enough to carry out the suggestion until last April, when Dr. J. MARION SIMS (*British Medical Journal*, June, 1878, p. 811) operated upon an American lady, aged 45, with great enlargement of the gall-bladder, from which nearly thirty ounces of fluid was removed, together with sixty gall-stones.

The operation lasted one hour and sixteen minutes. The most tedious part was securing the cyst in the incision and closing up the wound. She lived eight days. The operation was conducted under Lister's process. A *post-mortem* examination revealed no trace of peritonitis, the gall-bladder was firmly adherent to the abdominal walls, and contained sixteen gall-stones, which, being sacculated, had prevented them from being removed during life. Although the case terminated fatally, from the poisonous effects of absorbed biliary salts, still Dr. Sims regarded it as a triumph for Listerism; and the immediate benefit of the operation was shown in the relief of pain, itching, nausea, vomiting, and in the production of natural stools.

The fluid contained in the distended gall-bladder was proved, by analysis, not to be either bile or altered bile, but a sero-mucous liquid, secreted by the mucous glands and epithelial covering.—*London Med. Record*, July 15, 1878.

Enterostomy.

In the *Bulletin Général de Thérapeutique*, May 30th, M. SURMAY has an extensive and interesting article in which, starting with the statement of the well-known facts relating to deaths from inanition in cases of pyloric closure, and the very limited efficacy of rectal and subcutaneous alimentation, he questions whether it is not possible to act upon the small intestine just as upon the stomach when the cardiac extremity is closed; if, in other words, "enterostomy may not in certain cases render the same service as gastrostomy." He enters at length upon the consideration of the involved double problem of physiology and surgery: 1. "Will the intestinal digestion suffice for the elaboration of alimentary substances, in such manner as to render them assimilable and nutritive without the direct intervention of the stomach?" and 2, "Is it possible to make and maintain at a convenient point in the small intestine an opening through which may be introduced certain appropriate substances, that afterwards shall undergo the changes necessary to render them assimilable and contributive to nutrition?" He holds that all the chemical changes required in food to render it absorbable are effected in the intestine, and that but a single one of them commences in the stomach, and that the suppression of the gastric action does not very seriously affect nutrition (as indicative of which he cites the case of sphacelation of the entire mucous membrane of the stomach with almost complete integrity of the digestive organs, reported by Dujardin-Beaumetz), while it is altogether otherwise if the intestinal action be wanting, as has been shown in certain reported cases of artificial anus high up; and he believes that the first question can be answered in the affirmative, provided that proper means are adopted to prevent the escape, through the

opening made, of the biliary and pancreatic fluids; such means being the maintenance of the dorsal decubitus during digestion, and, if necessary, the use of a cup or India-rubber bag to catch the escaping liquids which can later be returned into the bowel. In opening the small intestine, the following procedure is recommended:—

On a line about a third of an inch internal to the anterior extremity of the ninth rib of the left side, a vertical incision from 2 to 2½ inches long is to be made in such a manner as that its central point shall correspond to the ninth rib. The skin, the superficial fascia, the external oblique, the internal oblique, and the transversalis muscles, and the transversalis fascia, are to be successively divided, and the peritoneum opened, with the usual precautions. The omentum being turned out of the way, and “the intestinal mass uncovered, the transverse colon, which is at the upper end of the incision, may be easily recognized, and very readily distinguished by its direction, by its colour, whiter than that of the small intestine, by its bands and constrictions, and, finally, by its relations with the omentum. Immediately below are the aggregated coils of the small intestine. Between these coils and the transverse colon, the index finger is to be carried directly down and pushed on until it meets the spinal column. The left extremity of the pancreas can then be felt, and immediately to the left of this extremity and, as it were, connected with it, an intestine, the direction of which is transverse. This intestine is to be hooked up with the curved index finger and drawn out. If it be perceived that it yields on one side, but remains firmly attached on the other, it is the jejunum at its origin. If, on the contrary, it can be equally well drawn up on both sides, it is a part of the canal further down, and must be let go, in order to search again. Most usually we come after the first stroke (*coup*) upon the part sought for, but if we fail it is not difficult, nor does it require any great length of time, to find it. Once seized, it is to be brought up between the lips of the wound in the skin and fixed there by a sufficient number of points of the interrupted suture. This done, the intestine can be opened and appropriate alimentary substances introduced.” The author in a foot-note says that he has selected the first part of the jejunum in which to make the opening, because it can be easily found by following the method indicated; while, if the incision be made in any other part of the abdominal wall, we have no certain means of knowing what part of the small intestine has been opened. Enterostomy then, being in a surgical point of view an operation perfectly according to rule, and physiologically considered a rational one, should, according to M. Surmay, be regarded as the proper one in those cases in which there is no cachexia nor hemorrhage, no threatened perforation nor peritonitis, where the real cause of the impending death is inanition consequent upon impassable constriction of the pylorus, or, the pylorus being open, upon absolutely uncontrollable vomitings due to nervous disturbance or even to simple ulceration of the gastric mucous membrane. Though enterostomy has never been performed upon the living human subject, and will remain an operation of altogether exceptional rarity, M. Surmay hopes that he has done something useful if he has been able to show that it is rational, easy of execution, and, to all appearances, capable of practical application.—*London Med. Record*, August 15, 1878.

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Foreign Body in the Sigmoid Flexure: Successful Removal.

A rare and curious case is related by Dr. STUDSGAARD of the Communal Hospital in Copenhagen, in a recent number of the *Hospitals-Tidende*. A man, aged 35, introduced into the rectum, with the open end uppermost, a preserve-bottle nearly seven inches long, for the purpose of stopping a diarrhoea. The next morning he complained of pain in the abdomen; chloroform was given, and

the bottle, which could before this be felt in the rectum, passed higher up, and he was brought to the hospital (January 10th). The bottle could be felt through the abdominal wall, lying in the middle line, with the bottom close to the horizontal ramus of the pubic bone. In the afternoon he was deeply narcotized, and posterior linear rectotomy was performed, and an attempt was made to reach the bottle, but without success. Abdominal section was therefore performed, under antiseptic precautions, in the linea alba. An incision having been carried four inches downwards from the umbilicus, a loop of intestine, apparently a portion of the sigmoid flexure, was protruded with the neck of the bottle. The bowel was then divided over the mouth of the bottle and a little way down the neck, and removal was effected slowly. The neighbouring parts were protected by sponges and compresses from the escape of feces; and, after the bowel had been cleaned, twelve or fourteen catgut sutures were applied to it, each being, for safety, tied with three knots. The bowel having been replaced, the wound in the abdominal wall was united by eight silk sutures. The operation lasted an hour. Recovery was slow, and the prognosis was for a time doubtful in consequence of local peritonitis and the formation of abscesses, which opened partly through the incision in the abdominal wall and partly through the rectum; the patient was, however, discharged quite cured on April 16th—less than fourteen weeks after the operation. The bottle was 17 centimetres (6.8 inches) long, 5 centimetres (2 inches) in diameter at the lower end, and 3 centimetres (1.2 inches) at the upper end. In commenting on this case, Dr. Studsgaard refers to three others of a similar character; one related by Ogle, in which recovery followed spontaneous discharge of the foreign body (a stick); one by Closmadeuc, where the patient died of peritonitis, without operation; and one in which laparo-enterotomy was successfully performed in 1849 by Reali of Orvieto.—*Brit. Med. Journal*, August 3, 1878.

Treatment of Hydrocele by Incision performed Antiseptically.

Dr. GENZMER (Volkman's *Klinischer Vörrage*, No. 135) gives a list of sixty-nine cases treated in this way without a single fatal result, and with no excessive inflammation. The average duration of the stay of patients in the hospital was ten days. There was in but one or two cases an elevation of temperature of more than three degrees. The method is to open the sac by an incision from three to four inches in length. The testicle is then examined, and if there be cheesy orchitis the diseased portions are laid open and scraped out. The edges of the tunica are then stitched to the scrotum with catgut sutures. The testicle now appears lying at the bottom of a gaping wound. A drainage-tube is placed vertically upon the organ, and the edges of the wound are partly approximated by one or two deep silk sutures to prevent the testicle from escaping from the sac. Primary union of the walls of the sac takes place, and a slight granulating surface is left at the end of a few days to mark the site of the cut. The tube is removed usually about the fourth day, when the silk sutures are also taken out, and the dressing changed a second time at the end of a week. The wound is then dressed with benzoated cotton-batting inside of a suspension bandage, and the patient discharged.—*London Med. Record*, Aug. 15, 1878.

Ergotin in Diseases of the Bladder.

Dr. MOLFESE, in the *Cirillo* of May 5, 1878, calls attention to the results of the internal use of ergotin in cases of paralysis of the bladder, hemorrhage, etc. He relates three cases. In the first, a priest aged 86 was suddenly attacked with retention of urine. After this condition had lasted 36 hours, the urine was drawn

off by a catheter; it was turbid and contained mucus and pus, and, eight days later, blood in large quantity. Injections of alum, nitrate of silver, and sulphate of zinc produced no effect. Dr. Molfese then ordered a spoonful of the following mixture every half hour: Bonjean's ergotin 1 gramme, water 100 grammes, syrup of orange peel 50 grammes. Injections of a very dilute solution of salicylic acid were also given. In eight days the blood had completely disappeared from the urine. The catheter was used for some days, and after treatment for a month the patient was cured. In the second case, a man aged 72 had retention of urine, which contained mucus, pus, and blood. After the use of ergotin for 20 days, the bladder regained its power. The third case was that of a man aged 51, who had twice suffered from gonorrhœa, specific ulcer, and suppurating bubo. For two months, he had been unable to retain his urine. After the use of ergotin for ten days, the incontinence had nearly disappeared; and, at the end of fourteen days, the patient was cured.—*London Med. Record*, Aug. 15, 1878.

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Syphilitic Stricture of the Rectum; Rectotomy by a new Operation.

In a clinical lecture reported in *Le Progrès Médical*, June 22, 1878, M. TRÉLAT relates the particulars of a case in which he practised division of a stricture of the rectum.

The patient was a woman (age not mentioned) who had been operated on by M. Trélat in 1873. The exact nature of the operation then performed could not be ascertained, as the notes had been lost, but she had been completely relieved at that time. Towards the end of 1877 the patient began to suffer from pain in defecation, together with a glairy yellow bloody discharge from the anus. Five months ago, feces began to escape from an opening at the lower and back part of the vulva, which induced the patient to apply at the hospital for relief. On admission, the woman denied syphilis, but had the remains of a syphilitic rash, and had been taking syphilitic remedies under the direction of her medical attendant. On examination, the anus was found smeared with fecal matter, and a bloody purulent discharge. Around the orifice were scattered elevated patches, and from the base of one of these ran a fistula, which communicated with the anal aperture by a short wide track. Other sinuses existed in the neighbourhood. Digital examination revealed the existence of a certain amount of contractile power of the sphincter. In the anterior wall of the rectum was a deeply depressed softened spot, in the centre of which was the orifice of a fistula, which ran towards the vulva. Behind, the tissues were softened and ulcerated. Above these was the stricture, and, above this again, thickening of the bowel extended higher up. The walls of the lower part of the rectum were thickened and traversed by fistula. After general antisyphilitic treatment and the local application of glycerine of starch, with rhatany and catechu, for three weeks, improvement had taken place. This, however, proved to be only temporary, and a month and a half after the commencement of treatment the following operation was performed. A solid steel rod, having at its end a movable and sharp pointed kind of needle or shuttle (*navette*), carrying a thread, was thrust upwards, parallel to and behind the rectum for a distance of about $3\frac{1}{2}$ inches above the anus. By a slight see-saw movement of the handle of the instrument, the point was now made to perforate the wall of the rectum, and the needle was thus carried into the rectal cavity above the stricture. Another steel rod, the end of which terminated in a frame, over which a layer of caoutchouc was stretched (very like a laryngoscope of which the mirror has been replaced by an elastic membrane), was next introduced up the rectum through the anus, and the point of the needle was then firmly fixed from below upwards in the caoutchouc. The rectal rod was now withdrawn, together

with the needle and thread. The posterior wall of the rectum, to a point above the stricture, was thus included in the loop. The thread was then replaced by the wire of the galvano-cautery, and division effected without the least loss of blood. The operation was performed on April 19. On the 28th the patient was attacked by pneumonia, very soon complicated with erysipelas of the face, the starting point of which was a large specific ulceration of the nasal fossæ. Death occurred on May 8, without any local accident having followed the operation on the rectum.

M. Trélat remarks that the above was evidently a case of the affection described by Guérin, Verneuil, Fournier, and himself as tertiary syphilitic affection of the anus and rectum, or ano-rectal syphiloma. The disease is caused by a syphilitic neoplasm of a special nature and different from gumma. The existence of multiple fistula is significative, and their appearance is characteristic of their origin. They are perfectly dry, and do not furnish any discharge. The fistulous track cicatrizes almost as soon as it is formed. It is often very short, and has then a punched-out appearance. The fistulæ affect *the portion of the rectum below the stricture*.

With regard to the effects of medication, M. Trélat differs from Fournier, who thinks specific treatment useful only at an early stage. In two of M. Trélat's cases, the affection was already of old standing, but, under mercury and iodide of potassium internally, with the local application of glycerine, diminution of the neoplasm, desiccation of the fistulæ, and disappearance of pain took place, and these good results have been obtained.—*London Med. Record*, Aug. 15, 1878.

Dupuytren's Contraction of the Fingers.

MR. WILLIAM ADAMS contributes to the *British Medical Journal*, June, 1878, p. 928, a paper upon this disease, illustrated with plates of the dissected parts. Mr. Adams has never met with a case in the female, and generally has found it to attack men in the middle, or beyond the middle, period of life.

The pathology and treatment of this form of finger contraction is still the subject of much difference of opinion, and Dupuytren appears to have been the first to investigate its anatomical condition by dissection. He found, the skin being removed from the whole extent of the palm of the hand, and the palmar fascia of the fingers, that the fold, or the puckering of this structure, entirely disappeared. The palmar aponeurosis was found retracted and diminished in length, its inferior part being divided into cords, which passed on to the sides of the affected fingers. On extending the finger, he observed that the aponeurosis underwent a kind of tension of crispation—this was a ray of light; so he considered the aponeurosis to be the cause of the disease. He cut the prolongations on the sides of the fingers, and immediately the contractions ceased, and the fingers were readily completely extended, the tendons being natural; the sheaths were not opened; the articulations, ligaments, and bones were in their natural state.

In one case of the affection that fell under Mr. Adams's care, a gentleman, suffering from Dupuytren's contraction of the fourth and fifth fingers of the right hand, while trying to hold a restive horse, had them torn open and the skin of the palm torn across, together with the palmar fascia; the sheaths of the tendons were not injured. The hand was bandaged with the fingers extended, and quickly healed, with the flexion power of the fingers perfect. Mr. Adams thinks that the affection depends nearly always upon a constitutional rather than a local cause, and essentially upon a gouty diathesis.

By means of a very small tenotomy knife, Mr. Adams makes multiple subcutaneous divisions of the palmar fascia, cutting downwards very slowly and cau-

tiously, taking care not to dip the point of the scalpel, or to divide any structures except the contracted band of fascia. In many cases, four punctures are sufficient for two fingers; if there be more than two to operate upon, it is better to confine the operation to two fingers. The fingers are immediately extended and retained by splints. The operation is readily performed under ether-spray, if the frozen skin be rapidly thawed by friction with the operator's warm hand, so as to leave the deeper parts insensible to pain.—*London Med. Record*, Aug. 15, 1878.

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Sequel to a Case of Aneurism of the Aorta, and the Innominate, Subclavian, and Carotid Arteries, treated by the Double Distal Ligature.

Mr. RICHARD BARWELL reported to the Royal Medical and Chirurgical Society (*British Med. Journ.*, June 8, 1878) the sequel to the case which was exhibited to the Society in November last (see the *American Journal of the Medical Sciences* for April, 1878, p. 275).

On November 14, the patient left the hospital. On the 20th, he came to the hospital on formal business; and, as he was suffering from bronchitis, Mr. Barwell persuaded him to remain. He was very intractable, and, not being allowed brandy, left on the 22d. He walked home (about two miles) very thinly clad, through snow and sleet, sat four hours in wet clothes without a fire, became rapidly worse, and died on November 24. On November 25, a *post-mortem* examination was made. The aneurism, which appeared solid, was removed, together with the heart and great vessels. No other disease was discoverable, except very acute bronchitis (mucopus in the large and small bronchi), hypostatic pneumonia, and œdema of the lungs. The blood in the arterial system was dark, like that of the veins. The aneurismal tumour, rather larger than a tennis-ball, sprang from the junction of the first and second parts of the aorta. Its pressure had altered the course and relations of the trachea and œsophagus; the large veins also were peculiar. It was remarkably hard and firm. At its upper part, it was elongated into a subsidiary enlargement, which lay in the neck, and was in front divided from the rest of the aneurism by a groove marked in it by the clavicle. The back of the sac was moulded in the apex of the lung. The sac was laid open from behind forward. There was within it, still persistent, a globular cavity, perhaps an inch in diameter; this was surrounded by a very firm clot of variable thickness; and in front, close to its opening into the aorta, it was rather more than one-third of an inch thick; behind, an inch and a half. The subsidiary tumour was quite obliterated, so that here the clot was more than two inches thick. No vessel opened out of the aneurism; the innominate being, like the right subclavian and carotid, obliterated. The left vessels came off from the aorta itself below the mouth of the aneurism. The specimen showed that the tumour had greatly shrunk since the operation; that the whole tumour was as much filled as could be expected in the time; that, had the man chosen to remain in the hospital, or been moderately prudent, the whole cavity must almost of necessity have become obliterated, since the aneurism, thickened by hard clot, could neither have enlarged nor burst; and, since there was no thoroughfare within the sac, there could have been no blood-stream through it. In fact, though the man, by his own perversity, contracted an intercurrent fatal disease, the aneurism was to all intents and purposes cured.

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Reunion and Restoration of Divided Nerves.

Mr. WHEELHOUSE, in his recent address on Surgery (*British Med. Journal*, Aug. 10, 1878), made the following remarks on this interesting subject:—

In the *Lancet* of June 1 of the present year (see *Monthly Abstract* for July,

p. 314) a series of experiments are recorded as in progress in Germany, the object of which is to ascertain whether the nerves, like other structures, are not amenable to surgical treatment for their restoration after division and complete loss of function; but, whilst the Germans are patiently experimenting to determine the point, it is my good fortune to be able to answer this question distinctly in the affirmative, as the following case will show.

On May 5, 1875, a patient named Adam Smith, a labourer, aged 22, entered the Infirmary at Leeds, under my care. He limped into the ward on crutches, his left lower limb being completely paralyzed and useless, and stated that he had come to request us to remove it, as an incumbrance. The story he told me concerning it was this. Nine months previously, as he was returning home one evening, at the close of his day's labour, carrying his scythe over his shoulder, being anxious to make a short cut to his cottage, he attempted to climb over a fence; in doing this, the point of his scythe caught in the hedge behind him; he was jerked suddenly backward, and fell with the back of his thigh upon the sharp edge of the implement. The result of this was a ghastly wound, the contracted cicatrix of which measured nine inches in length when I first saw it nine months afterwards. He lay, bleeding profusely, where he fell for many hours before he was found and carried home; there the hemorrhage was stanchcd, the wound was dressed, and, in process of time, it slowly healed; but he noticed, during the whole time so occupied, that the limb was slowly wasting and withering away, and that it manifested no sign whatever of any returning sensibility.

Eventually, when he was able to leave his bed, he found to his horror that, although the wound was healed and the limb was apparently saved, it had become wholly useless to him. So far as the distribution of the sciatic nerve was concerned, the power of sensation was entirely lost; of voluntary muscular power he had none, and the joints were relaxed and flaccid.

I need not detail to you all the efforts, vain efforts indeed, that he made to recover the lost powers of the limb; suffice it to say that, receiving no benefit from anything he did or tried, he finally came to the hospital to ask for its removal.

The whole cause of the mischief was, of course, clear at a glance. The sciatic nerve had been divided, and, in the healing of the wound, the separated ends had never reunited. Here, if ever, was a fair opportunity to test the question: Are nerves which have been divided, and have long remained disunited, capable of restoration?

I called my colleagues to my assistance in forming an opinion on the matter. Dr. Clifford Allbut was good enough most patiently and carefully to test electrically the condition of the disused and wasted muscles, and he reported that, though not wholly destroyed, their irritability was well nigh exhausted. My surgical colleagues agreed with me that whereas, should the attempt to restore the lost nerve-power altogether fail, I could still, as a last resource, remove the limb, I should be justified in making an attempt to reunite the ends of the divided nerve. After fully explaining to the patient the position of affairs, and obtaining his assent, I determined to do so.

Having laid open the back of the thigh, and, by a careful and deliberate dissection of the parts, exposed the wounded nerve, I found it completely cut across; the two ends were firmly felted in cicatricial tissue two inches apart. On the upper end was a large bulbous swelling, the lower appeared atrophied and somewhat wasted. Both were carefully loosened and detached; the bulb was removed from the upper one, and each was then pared obliquely until apparently fresh nerve-tissue was exposed. When I then attempted to bring them together, the nerve was found to be so much shortened that I could not do so until I flexed the

knee fully. This enabled me to make the ends of the nerve meet without strain; they were then carefully stitched together with very fine carbolized catgut thread, the wound was closed, the ankle was firmly lashed to the buttock, and in this position the patient was put to bed.

I will not weary you with details. Suffice it to say that little by little, and in very wandering fashion, day by day, and week after week, sensation was found to be returning in the limb. At the end of five weeks, I began slowly to relax the position and let down the leg inch by inch, until at length it became straight again, and then, to my intense satisfaction, I found that the restored sensibility remained. By very slow degrees, the power of voluntary motion also returned, and, on August 7, he was discharged from the hospital so far cured that, with the help of two sticks, he was able to support himself on the limb, and could walk. From that time to this, he has gone on improving. During the whole of the past winter he has worked in the fields as he was wont to do before his accident, requiring neither stick nor support, nor help of any kind; and, though the limb remains greatly inferior in size and nutrition to the opposite one, it is, to all intents and purposes, a useful member again.

Since the performance of that operation, my colleague, Mr. Atkinson, has in similar manner successfully reunited a divided median, and Mr. Jessop has reminded me that, long prior to my case, he also had been equally happy in thus dealing with an ulnar nerve.

Severe Injury of the Axilla during Reduction of a Dislocated Humerus.

Mr. THOMAS SMITH, in the *Lancet*, July, 1878, p. 3, reports a case where, with the heel in the axilla and from a force not greater than that usually employed, the axilla tore as though it had been wet paper, the foot apparently cutting its way through the tissues and not tearing them by excessive stretching. The patient was a cellarman, aged 58, who had eight weeks previously fallen on his elbow and received a subglenoid dislocation of the humerus, which, however, was not detected at the time. He died nine days afterwards from exhaustion. The pectoral muscles were almost completely torn across, the vessels and nerves uninjured.

On *post-mortem* examination, diffuse suppuration was found to exist in and around the axilla, and the parts about the upper and middle lobes of the right lung were in a state of consolidation. The heart was flabby; the liver large, pallid, and fatty; the kidneys normal; the spleen large, soft, and semifluid; vessels of the size of the tibials were rigid from calcareous degeneration. The muscles generally were paler, softer, and more flabby than normal. At the seat of injury, nothing could be ascertained as to their condition as regards degeneracy, owing to the amount of sloughing that had taken place. No microscopical examination was made.

[This case is one of very great rarity, if not unique. Several instances are recorded in which injuries of the axillary vessels and nerves have occurred in the reduction of old dislocations of the humerus, and are referred to by Mr. Erichsen in the *Science and Art of Surgery*; but cases of such extreme friability of the parts as is described by Mr. Smith are apparently unknown, or almost so, in surgical literature.]—*Lond. Med. Record*, Aug. 15, 1878.

Arthritis Secondary to Acute Myelitis.

The occurrence of arthritic changes secondary to chronic spinal affections is now well established, but instances of those changes as the result of such acute affection of the cord as give rise to the sloughing of the tissues have very rarely

been recorded. Such a case has been described by M. VALLIN in a recent number of *L'Union Médicale*. Complete paraplegia came on in the course of two days in a healthy young man, accompanied by loss of sensibility and of power over the sphincters, death occurring at the end of two months in consequence of extensive bedsores, which had commenced on the second day of illness. The initial lesion was found to have been confined to the gray matter and posterior column. Phlyctenules had formed on the feet, and the paralyzed parts were the seat of a hard œdema extending as high as the loss of sensibility. The urine was not albuminous, and the kidneys were healthy. Effusion into both knee-joints occurred in a month after the onset of the paraplegia, sufficient to elevate the patella from the condyles. After death one of these joints was found to contain about two ounces of purulent dark-coloured liquid. The synovial membrane was thickened, infiltrated, and indurated, and its fringes were opaque and purulent in aspect. The cartilages were covered by flakes of pus. The inner aspects of the condyles of the tibia and femur were entirely deprived of their cartilage, and the denuded bone was porous and friable. The other knee-joint only contained a quantity of lemon-coloured liquid. The marrow of the bone in the vicinity of the joint most affected had undergone fatty change, and the bony tissue presented all the signs of osteitis.

It is probable that cases similar to this have led to the prevalence of the opinion, which is very common among French authorities, that all acute affections of the spinal cord are "rheumatic." The arthritic changes are not uncommonly regarded as the manifestation of acute rheumatism, when they are really secondary to the nervous affection.—*Lancet*, August 24, 1878.

Dislocation of the Muscles and their Treatment.

MR. GEO. W. CALLENDER (*British Medical Journal*, July, 1878, p. 51) discusses this class of injuries, which are far from being rare, and yet are seldom alluded to in surgical works. Slight as are many of these hurts, in a surgical point of view, still they so seriously interfere with the comfort of the patient, and are attended with so much chronic pain, as to make their diagnosis and treatment a point of great interest to all. The tendons most frequently affected are that of the biceps and the ligamentum patellæ. Dislocation of the biceps tendon, when the sheaths that bind it in its groove are torn, is frequently beyond treatment, as far as regards cure. The leaders of the wrist are often great sufferers, and it is only within the few weeks following the occurrence of the accident that the repair of the surrounding tendinous injuries has a chance of being perfected by prompt reduction and rest.

A most troublesome case of dislocation of the two peronei from behind the external malleolus fell under Mr. Callender's care. It had occurred two years previously, and could only be relieved by instrumental aid. Rupture of the muscular sheath, causing protrusion of the exposed muscle, is not at all an uncommon accident, and is very difficult to cure radically.

Dislocations of the muscles themselves are also not rarely met with, causing great misery until reduced, attended as they are by tearing of surrounding parts, straining of nerve-fibres, rupture of small vessels, and pain in every effort of the displaced muscle. A man carrying a heavy box down stairs, slipped in his endeavours to recover his footing, twisted himself, and, at once, felt a severe pain in the lower dorsal region of the spine, by the side of the spinous processes; over the painful spot a slight swelling could be felt. By placing the patient in the position that caused least pain, the muscle was relaxed, and then, pressure with the hand armed with a pad of lint, and the patient moving so as to bring the displaced muscle into play, quickly caused reduction. Rest for a time apparently

cured him, but he was afterwards subject to returns of the displacement, which he learnt to reduce himself. Another case of dislocation of the pronator radii teres, whilst playing lawn tennis, fell under Mr. Callender's notice, and led him to study the subject of muscular dislocation, which had been previously discussed by M. Ponteau, who relates an interesting instance where a young girl dislocated one or more of the digitations of the splenius. If, then, we meet with a case in which sudden and unusual movements of the body have been followed by pain—local in its character—made worse by certain movements, or preventing certain movements, and especially if such pain be referred to the site of muscular digitations about the spine, etc., it is wise to adopt measures to reduce muscular dislocations, by relaxing the muscles or part of muscle displaced, and by rubbing, kneading, or pressing, while attempting to reduce it; if this fail, make pressure over the part while the muscle is brought into play. As we need guidance from the patient, these manipulations, often painful, had better be done without the aid of anæsthetics.—*London Medical Record*, Aug. 15, 1878.

Muscular Necrosis.

Dr. LÜCKE (Strasburg) related, at the late Congress of the Society of German Surgeons, the case of a medical student, who, while on the ice on February 10th, slipped and fell. He did not feel any special pain, and no extravasation of blood could be seen. While in bed on the evening of the same day, he was attacked with severe pain in the leg, in the middle of which a small swelling of the size of a cherry was detected. The pain became so severe that Dr. Kohts administered chloral, injections of morphia, ice, etc., but without result. On February 13th, leeches were applied, without relief. On the 21st Dr. Lücke saw the patient for the first time. The whole leg appeared swollen, and a point at the upper part, between the bones, was very painful, and projected considerably. Percussion showed that the case was not one of osteomyelitis of the tibia; the fibula was inaccessible in consequence of the swelling of the soft parts. An incision was made, and a piece of muscle in a state of waxy degeneration escaped, but no pus, although the tibia was partly denuded of periosteum. The operation was done under antiseptic precautions. On February 23d the dressing was renewed, and a small purulent shred of tissue, which unfortunately was not examined, escaped on pressure. There was moderate and limited suppuration on the 25th. On March 3d the temperature was 103.3° Fahr. Several deep incisions were made, which gave exit to pus and to a quantity of offensive gas, which was probably the cause of emphysema which had been observed in the thigh. On March 9th, while the wound was being cleansed, the whole of the tibialis anticus was drawn out; and on the 10th the extensor of the great toe and the common extensor of the toes were removed. These muscles were quite necrosed, and had a peculiar waxy colour. Microscopic examination showed, towards the upper end, small quantities of colouring matter of the blood and crystals of hæmatin. The subsequent progress of the case was very favourable; the patient, however, was obliged to wear an apparatus to counteract the preponderance of the sural muscles arising from the loss of the extensors of the legs. The necrosis was probably due to embolism of the artery supplying the parts. The pulsation in the dorsal artery of the foot remained unaffected throughout.—*London Med. Record*, June 15, 1878.

Effect of Posture on the Peripheral Circulation.

Mr. LISTER recently read a paper on this subject before the Paris Académie de Médecine. According to the report in *L'Union Médicale*, he stated that he

had been led to attend specially to the subject when studying the resection of the wrist for caries. In order to prevent the hemorrhage he applied Petit's tourniquet upon the arm, after having raised the limb for some minutes. By this means the limb was rendered almost exsanguine. Later, in 1873, it occurred to him that this result was not the simple mechanical effect of gravitation, but was a reflex phenomenon caused by the emptying of the veins producing contraction of the muscular fibres of the arteries. In surgery this method of raising a limb, and then applying at its root a tourniquet, has all the advantages of the system of Esmarch without its inconveniences, such as the danger of forcing septic matters into the interstices of healthy tissues. In order to observe the effect better Mr. Lister performed the following experiment on a horse. By means of cords and pulleys attached to the legs of a horse he varied the position of one hind leg, at one time elevating it while the animal was on its back, at another keeping the leg horizontal while the horse was on its side, and at another allowing it to stand upright with the leg downwards. The metacarpal artery having been exposed, it was seen that when the leg was raised the artery did not pulsate, and that the wound, being cleared of blood, resembled one made after death. By means of a gauge the diameter of the artery was ascertained. When the leg was raised the diameter of the vessel scarcely exceeded that of the same artery divided and emptied, while in the horizontal position, and especially while the limb was dependent, the enlargement of the vessel was considerable. By calculating the internal area from the external diameter, it was estimated that on changing the position from an elevated to a horizontal position, the calibre of the vessel was increased threefold, and that it became increased sixfold when the limb hung down.

Mr. Lister demonstrated the effect of his method on the arm of one of the servants of the Academy, and showed that if a limb was raised and a tourniquet applied it remained pale and bloodless, even when it was allowed to hang down, and on raising the limb again and removing the pressure, the colour rapidly returned to it, in spite of its position, which was the same as that in which it had become pale and exsanguine before the application of the tourniquet. He explained this result by supposing that after the tissues of a limb have been deprived for a certain time of all circulation, there is, so to speak, a need for the circulation, and that this need acts as a stimulus, and determines a relaxation of the arteries by acting on the vaso-motor system just as warmth does. This stimulus of need of circulation, which causes the relaxation of the arteries, becomes stronger than the stimulus of relaxation of the veins excited by gravitation, which under other circumstances would have caused their contraction. In consequence, the reaction is strong in proportion to the duration of the constriction. Another experiment consisted in exciting the circulation by a short run, then raising the arm for a few minutes, and then lowering it. The member became reddened and congested just as after the application of cold. As evidence that these phenomena depend on a reflex action, Mr. Lister pointed out that if their cause were purely mechanical and physical, the lower part of the artery of a raised limb would have increased in size, since it would have been overfilled; but the actual state is the reverse. The femoral artery of the leg of a calf was exposed close to the abdomen. After the contraction caused by the irritation of the operation had ceased, he measured the external diameter of the vessel in different positions of the animal, and the results accorded exactly with his previous conclusions. Finally, Mr. Lister pointed out the application of the theory to several phenomena, such as the good effects of the elevation of parts the seat of inflammation, and the treatment of epistaxis by elevation of the arm. Raising the arm produced, according to him, a reflex contraction of the arteries of the upper limbs,

and, consequently, a sympathetic contraction of the facial arteries, leading to the cessation of the hemorrhage.—*Lancet*, June 29, 1878.

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Application of the Poro-plastic Felt Jacket.

Mr. WILLIAM ADAMS, before the Surgical Section of the British Medical Association (*British Med. Journal*, Aug. 24, 1878), gave a practical demonstration of the mode of applying the poro-plastic felt jacket during suspension in cases of spinal disease and spinal curvature, in a manner similar to that recommended by Dr. Sayre in the application of the plaster-of-Paris jacket. Mr. Adams considered that the American system of treating spinal disease with angular curvature, as well as some cases of lateral curvature, by suspension, and the application during suspension of a plaster-of-Paris jacket, was the greatest advance recently made in the treatment of these affections. The system of extension by the head, as well as by the arms, is said to have been of ancient date. It was certainly practised in London by Mr. Stafford more than thirty years ago, and the apparatus for head extension is figured in his work on the spine. Mr. Adams had for more than twenty years practised extension by the arms, using for this purpose the trapeze bar, in cases of lateral curvature, and the effect of extension in straightening the spinal curvature was well known. English surgeons, however, always trusted to recumbency and gymnastics for retaining any advantage gained. The originality of the idea of retaining the advantage gained by suspension, by the application of a plaster-of-Paris bandage or jacket whilst the body is suspended, is undoubtedly of American origin, and it is to Dr. Sayre that English surgeons are indebted for the knowledge of this system of treatment. The substitution of the material known as poro-plastic felt, which has been used for some years both in America and in England, for fracture-splints, etc., for the plaster-of-Paris bandage or jacket, will, it is hoped, overcome many of the objections raised to the use of the plaster-of-Paris jacket. Experiments with the poro-plastic felt were made, at the suggestion of Mr. Adams, in the early part of the present year by Mr. Ernst, with the assistance of the inventor, Mr. Cocking. Mr. Ernst has now brought the poro-plastic felt jacket to a high degree of perfection, as shown by its application to several cases before the meeting. Mr. Fisher has, at the National Orthopædic Hospital, applied a large number of these jackets, and considers them to be quite as efficient, and, in many respects, superior to the plaster-of-Paris jacket. These poro-plastic spinal jackets cannot be made out of the sheet felt, but must be manufactured on wooden blocks, and are kept in different sizes. After the proper measures have been taken, one of the jackets approximating to the required size is softened in an oven, or hot-air chamber, at a temperature of 180 deg. This occupies from three to five minutes, during which time the patient is being suspended, precisely in the same way as when Sayre's plaster-of-Paris jacket is applied, and a tightly-fitting gauze vest is drawn over the body. The body is then wrapped round with a sheet of cotton-wool, which forms a soft padding, and is useful as a non-conductor of heat. This was suggested by Dr. Yandell, of Kentucky. The softened jacket is then applied, and rapidly moulded to the trunk whilst the patient is suspended. It is then buckled in front, and a broad bandage is firmly and rapidly applied round the jacket from the top to the bottom; the patient still being suspended. In two minutes from the time of application, the jacket will be found to be cool and firmly set, and the process complete. It can be removed at pleasure for the purposes of sleep, washing, and gymnastic exercises, so useful in lateral curvature. It can be softened and reapplied, as improvement in the spinal curvature takes place; and the same jacket will last a year or more.

Varicose Ulcer and its Treatment.

Mr. JOHN GAY, in another of his instructive papers, explains, in the *Lancet*, June, 1878, p. 928, that the essential factors, in respect of a varicose ulcer, are extreme degeneration of the vein, and resultant incompetency of its valve—always a barrier-valve, that is, a valve that intercepts all regurgitation of blood, or any attempt to force the finest injection from above, through one such barrier, to a segment below, which barrier-valves are placed in certain situations on the venous circulation of the leg. One is met with a short distance below the knee-joint; a second a short distance above the ankle-joint; a third immediately below that joint. A varicose ulcer is always met with in close contiguity to one of these barriers, especially those above and below the ankle-joint, and is closely associated with incompetency in a saphenous tributary—not the saphena itself.—*London Med. Record*, Aug. 15, 1878.

The Transplantation of Tissues.

A series of systematic experiments on the transplantation of tissues has recently been carried out by Dr. ZAHN. The first observations were made on the transfer of hyaline cartilage from one adult animal to another. The tissues into which the fragments were implanted were the subcutaneous connective tissue, the anterior chamber of the eye, the submaxillary glands, the kidneys, the testicles, and the bloodvessels. These attempts yielded, however, negative results; the cells of the tissue perished, the intercellular tissue persisted, but the fragment became encapsuled by connective tissue. The experiments were much more successful when the fragment was taken from foetal cartilage, which showed a remarkable capability of developing in another organism, even in that of an adult animal. If some cartilage were rubbed up with amniotic fluid, the smallest quantity of the mixture produced, in about six weeks, nodules of cartilage the size of a lentil seed. On injecting this mixture into the jugular vein, numerous growths of cartilage were subsequently found in the lungs. The capacity of foetal cartilage to develop is so great that these results were obtained, not only with animals of the same species, but even with those of different species. For instance, cartilage from the foetus of the cat gave rise to nodules in rabbits. Experiments were also made with the cartilage from an enchondroma, with less uniform success than with foetal cartilage, but with much more success than with ordinary adult cartilage. In several instances the attempts to transplant it were successful. This is, it is hardly necessary to point out, a result of much interest in connection with the diffusion of enchondromatous growths. With other foetal tissues Zahn was also successful. A piece of growing bone, for instance, became connected with the bloodvessels of the tissue into which it was placed and became nourished. Entire bones were even thus implanted, and, although they did not grow as a whole, they preserved their form, and outgrowths occurred—exostoses and enchondromata—at both the epiphyses and diaphyses. From these experiments, and those of previous investigators, Zahn concludes that only foetal tissues, and such adult tissues as preserve their foetal peculiarities, can develop in another animal, or in another part of the same animal. Only, for instance, the red marrow will do so, and the periosteum of young individuals. Such tissues alone possess the capability of persisting until they have come into relation with the new organism.—*Lancet*, August 24, 1878.

OPHTHALMOLOGY AND OTOTOLOGY.

Iodoform in Eye-Disease.

Mr. PATRICK J. HAYES, of Dublin, calls attention (*Med. Times and Gaz.*, Aug. 17, 1878) to the value of iodoform as a therapeutic agent in the treatment of certain subacute and chronic diseases affecting the eyes and eyelids.

Many practitioners are of course aware that for a considerable time iodoform has been used as an application in cases of trachoma or granular lids, and reports have been published, in America and elsewhere, illustrative of the good results which frequently ensue upon its employment. Mr. Hayes has not, however, seen any recommendation of it for such cases as phlyctenular and pustular ophthalmia, corneal ulceration, obstinate keratitis, ciliary blepharitis, etc.; hence, as he has found it to benefit several patients so affected, he ventures to invite for it a trial at the hands of his *confrères*. With respect to the method of application, it is his custom to crush the crystals until they become reduced to a very fine powder, and then, with a delicate camel's-hair pencil, the powder is *freely* dusted over the affected surface. For use upon the eyelids such an ointment as the following will be found convenient: Iodoform, 1 part; vaseline, 4 parts—mix.

Iodoform, when brought into contact with the eye, does not give rise to pain, and children who have once experienced its effect will readily tolerate subsequent applications.

Mr. Hayes adds that it is not suitable for, and ought not to be used during, the early or acute stage of conjunctivitis.

Case of Gummy Tumour of the Conjunctiva.

Dr. ALBRECHT BERGER relates this case in the *Aerztliches Intelligenz-blatt*, April 23, 1878. On November 8, 1877, a young married woman, aged 30, applied to Dr. Berger at Munich on account of a sudden dilatation of the pupil of her left eye. The eye was free from pain, and presented nothing abnormal on ophthalmoscopic examination, but the pupil was widely dilated and fixed. There was a faint copper-tinted eruption on the forehead; and, although no history of syphilis could be obtained, the case was considered to be one of that nature. Under treatment with iodide of potassium, the constant current, and the instillation of eserine, the pupil resumed its normal appearance and functions in about three weeks.

In January, 1878, the patient presented herself again in the following condition. She looked cachectic and extremely ill; there was a well-marked syphilitic eruption on the forehead and face, and some swelling of the cervical glands; the skin of the upper lid of the right eye was red and thickened, and covered with a scaly eruption; the iris of this eye was discoloured and indistinct, and the pupil contracted and fixed. At the inner margin of the cornea, beneath the conjunctiva, was a small round nodule of a yellowish-pink colour, around which was a zone of extremely congested vessels; the cornea itself was hazy at this spot. On the left side, the eyelids were covered with a similar scaly eruption, but the pupil acted properly, and the eye appeared in every respect normal.

The patient was put under the influence of mercury, but the inflammatory process rapidly increased and the nodule became much enlarged; at the same time a brown-red mass of lymph made its appearance upon the anterior surface of the iris; this rapidly occupied the inner quadrant of the anterior chamber, and came in contact with the back of the cornea. Having reached this point it as rapidly receded and diminished in size, and about eight days afterwards the pupil became

dilated under the use of atropine, and a reddish-yellow stain was all that remained upon the iris; at the same time, the conjunctival swelling gradually diminished.

In this instance, the gummy swelling was associated with a dilated pupil without any impairment of the accommodation, and with no implication of any of the muscles, although the coexistence of a specific eruption pointed to the origin of the affection as being syphilitic. Soelberg Wells has described a form of mydriasis as the result of syphilis; and De Méric (*British Medical Journal*, 1869) has put upon record four cases in which mydriasis with ptosis was observed, and two others in which mydriasis occurred alone; and Wecker (*Maladies des Yeux*), as also Erlander (*Klin. Monatsblätter*, 1870), has described cases which bear a close resemblance to the case above recorded.—*London Med. Record*, June 15, 1878.

Daltonism: Sanitary Precautions and Preventive Measures.

M. A. FABRE communicated to the Académie des Sciences (*Gaz. Hebdomadaire*, June 14, 1878) a note which is summarized in the following conclusions:—

1. Daltonism consists in ignorance or confusion of colours.
2. There are in France more than 3,000,000 persons affected with Daltonism.
3. The number of females attacked, as compared with men, is about one to ten.
4. In nine out of ten cases it may be easily cured in young subjects.
5. The best means of treatment consists in methodical exercise of the eyes on coloured objects.
6. The women of a family ought to undertake the development of the chromatic sense in children, and especially those who may commit errors in the denomination of colours. They should be careful not to ridicule these "Daltonians."
7. In future no one ought to be admitted into the service of the railways, the marine, or schools of painting without an examination as to colours.
8. Ignorance of colours should not exempt from service in armies by land or sea, but the "Daltonians" should never be intrusted with any service connected with coloured signals. Regular exercises in colours should be instituted both in the marine and the army.
9. Examinations and exercises in colours should be established in all schools.—*Med. Times and Gaz.*, June 22, 1878.

MIDWIFERY AND GYNÆCOLOGY.

Induction of Premature Labour.

Dr. SCHAUTA, assistant of Dr. Späth, in the Vienna Midwifery Clinic, in an article in the *Wiener Med. Woch.*, May 11, observes that some time since he perused an account of two dropsical women in whom Dr. Massmann, of St. Petersburg, had employed a hypodermic injection of pilocarpin for the purpose of inducing sweating. It happened that both these women were pregnant, and in both premature labour occurred a few hours after the pilocarpin was administered. These cases did not prove much, as they were not very exactly observed as regards the period of pregnancy, while premature labour is not an uncommon occurrence in dropsical pregnant women having Bright's disease. Still, he resolved on the first occasion that presented itself to test the power of pilocarpin as an abortive agent. On May 1st a primipara aged twenty-two was admitted, and a minute account of her condition and of the measurements of the pelvis is furnished. It will suffice to say that she was robust and in good health, with no signs of rickets presenting themselves, her last menstruation being supposed to

have occurred on August 2 to 6, 1877. However, the pelvis having been found so contracted that the passage of a child at the normal end of pregnancy would be exceedingly doubtful, Prof. Späth consented to an attempt at induction of labour by means of pilocarpin. On May 3d, at 3.23 P. M., the contents of a Pravaz syringe full of a 2 per cent. solution of the muriate of pilocarpin were hypodermically injected in the left thigh. The first results observed at the end of 4 minutes were dilatation of the pupils (which had been contracted), disposition to vomit, sweating of the face, and a flow of saliva, which were soon followed by a sweetish taste in the mouth and trembling of the lower extremities. The secretion of sweat then rapidly appeared over the whole body, increasing at the same time on the face. At the end of a quarter of an hour the sweating had reached its maximum, and then became quickly arrested, chilliness as if from evaporation replacing also the former sense of heat. The salivation, which had kept pace with the sweating in intensity, also ceased almost suddenly, although a relapse lasting for 2 minutes occurred 26 minutes after the injection had been effected. During the whole time the thermometer in the axilla remained unchanged (36.8° Celsius), the pulse rising from 68 to between 92 and 100, and the respirations increasing from 24 to 40. All these phenomena then abated, so that by 5 o'clock the patient's state had become quite normal, or, as she expressed it, she felt just as she did in the morning. When seen at 6.15 she stated that she had since felt painful contractions in the abdomen. Her temperature was the same, the pulse being 72, and the respirations 32. An examination was made, and the cervix, which had been firmly closed, was found to be looser, its canal admitting the finger to the extent of 3 centimetres; and the head was plainly felt through the membranes. She had some hours' interrupted sleep, but perceived no pains. Examined again at 10 o'clock: the canal of the cervix was found more dilated and only 2 centimetres in length, the membranes being distended. Besides the mucus on the finger, some blood was observed. At 10.7 another injection of pilocarpin was made on the left forearm, and in two minutes afterwards sweating of the face appeared; and the phenomena succeeded each other exactly as they did after the first injection, even to the occurrence of the relapse of the salivation at the end of 25 minutes. Shortly after 11 o'clock the patient fell asleep, and awoke at 5 in the morning, complaining of pains in the abdomen and a sense of pressure downwards. By 5.45 the pains had set in regularly, and (without going further into details) the labour was terminated at 8.25 by the birth of a living female infant. The placenta was discharged spontaneously at the end of 20 minutes, and the uterus contracted well. At the date of the report (May 9th) both mother and child were doing well.

The child weighed 2275 grammes and measured 47 centimetres. That its birth exhibited the power of the pilocarpin is shown by the fact that the mother during several days she had been under observation had not felt the slightest pain, the cervix also remaining prior to the injection completely closed; while after the administration of this the action became rapid and energetic. Dr. Schauta believes that this case and those reported by Dr. Massmann at all events show decidedly the desirableness of additional trials of pilocarpin being made with respect to feeble pains, abortion, etc.—*Med. Times and Gaz.*, July 13, 1878.

The Revolutions of the Fœtal Head in Passing through a Brim contracted only in the Conjugate Diameter.

A laboratory note on this subject was, at a recent meeting of the Obstetrical Society of London (*Med. Times and Gaz.*, June 22, 1878), contributed by Dr. MATTHEWS DUNCAN. The only point considered in the note was movements of the fetal skull in a coronal plane—that is, revolutions around the pubic part

of the pelvic brim and around the promontory of the sacrum—movements resembling right and left lateral flexion, or like revolution in an internal or occipito-frontal axis. From this last kind of movements the revolutionary movements were distinct, because the revolutionary movement on an external axis implied progress of the head as a whole, and not mere movement in itself. Dr. Duncan's conclusions were based chiefly on experiments with fresh mature fetuses and modern pelvic brims, and tallied remarkably with the results of clinical observation of the progress of the head in head-last and in head-first cases in simple narrow pelvis. Recent inquiries into this subject had increased our practical usefulness distinctly, and further elucidation of it was desirable. The experiments were made in imitation of footling cases, and the first result of traction through the spine was a revolution around the pubic part of the brim, the sagittal suture approximating to the pubes. The side of the base of the skull placed posteriorly passed first through the contraction and during the first revolution. The side of the vault of the skull placed anteriorly passed first, and during the second or greater revolution. Litzmann, Kleinwächter, and Spiegelberg described only the first revolution, or rather its analogue in head-first cases. Burner described only the second or greater revolution. Goodell, in singular accordance with the conclusions of this note, described two movements, but not as revolutions; and he made this accurate description of both head-first and head-last cases. The movement of the sagittal suture towards the sacrum (and the base of the fetal skull in nearly an opposite direction), in the first part of the passage in head-last cases, was analogous to the movement of the sagittal suture forwards at the same stage of a head-first case. In both the head was revolving to a slight degree on the pubic part of the brim of the pelvis. The movement of the sagittal suture towards the symphysis (and the base of the fetal skull in nearly an opposite direction), in the second and greater part of the passage in head-last cases, was analogous to the movement of the sagittal suture backwards or towards the hollow of the sacrum at the same stage of a head-first case. In both the head was making its greater revolution on the promontory of the sacrum.

The Etiology of Face Presentations.

In a paper published in the *Archiv für Gynäkologie*, B. xii. H. 2, Dr. MAYR maintains a view similar to that of Hecker on the influence of the primary shape of the skull in the production of face presentations, and supports it by statistics derived from the Lying-in Hospital at Munich. In 14,519 deliveries there were 107 face presentations, or 0.73 per cent., and 15 brow presentations, or 0.103 per cent. The number of first positions of the face to second positions was in the ratio 1.4 to 1. Hecker's statistics give a ratio of 1.3 to 1, and therefore taking the normal ratio of first to second positions of the vertex as being 2.3 to 1, it is proved that a face presentation arises more easily when the back of the child lies to the right. The mean direction of the first stage of labour in 38 primiparæ was 23.6 hours; that in 69 multiparæ, 14.5 hours. The mean duration in the second stage in the 38 primiparæ was 12½ hours; in the 69 multiparæ, 1.26 hours. The general duration of labour was therefore considerably greater than in vertex presentations, although it was accelerated artificially in a greater proportion of cases. Version was not employed in any of the 107 cases, but forceps were used seven times, or in 6.5 per cent. of the cases, the general forceps ratio being only 2.5 per cent. Rupture of the perineum occurred in seven cases, but in none of those in which forceps were employed. This gives a proportion of 6.5 per cent. of ruptured perineum, while that in vertex presentations was 4.6 per cent. Of the 107 mothers, 11 suffered from puerperal maladies. Four patients delivered by

forceps suffered from puerperal peritonitis. Three of these died; the fourth was removed while seriously ill, and the issue was not ascertained. Another case of severe puerperal disease was also removed, and the result remained unknown. Thus cases of face presentation gave a mortality of 2.8 per cent. or more, and a morbidity of 10.3 per cent., as against a general mortality of 1.7 per cent., and a general morbidity of 4.7 per cent. As to the children, 52 were male, 55 female; 2.8 per cent. were dead before labour commenced, as against a general percentage of 2.19; 6.54 per cent. died during labour or shortly after delivery, as against a general percentage of 3.1. Face presentation is therefore shown to involve a considerable increase of danger both to mother and child.

With regard to the causes which promote face presentations, the author found that in 63 cases the proportion of the weight of the child to its length was above the normal mean ratio, and in 47 cases was below it. The mean in face presentations was .6699 grm. in weight per 100 cm. of length; the normal mean, as derived from the statistics of various authors, being .6484 grm. per 100 cm. in length. There is, therefore, some confirmation for the inference arrived at by Ahlfeld on the ground of theoretical mechanics, that the greater the weight of a child in proportion to its length, the more readily is a face presentation produced. The heads were measured after delivery as to their circumference, antero-posterior diameter, diagonal (or maximum) diameter, and greatest transverse diameter, and many of them were also measured after the lapse of a week. The mean circumference was found to be 0.93 cm. above normal; mean diagonal diameter, 0.26 cm. below normal; mean antero-posterior diameter, 0.59 cm. above normal; mean transverse diameter, 0.11 cm. above normal. These results coincide with those of Hecker in showing, in cases of face presentation, an excessive prolongation of the occiput, and an excessive maximum transverse diameter. The author thinks that the former is due in part to the mechanism of delivery, but that this is not sufficient to account for the whole.

In normal skulls the antero-posterior diameter is 1.72 cm. less than the diagonal (or maximum) diameter; in the cases of face presentation the mean difference was only 0.87 cm. In 46 of these, measured again after the interval of a week, the mean difference was 1.11 cm. The author has no corresponding figures for skulls delivered by the vertex, and measured at the end of a week. Budin, however, from heads measured forty-eight hours after birth, at which time he considers them to have recovered their normal shape, gives a difference between the diagonal and antero-posterior diameters of 1.75 cm., somewhat greater than that immediately after delivery. The author therefore concludes that this unusual length of the antero-posterior, compared with the maximum diagonal diameter, by which is implied an excessive projection of the occiput, was a primary quality of the heads delivered by face presentation, and not merely the result of the mechanism of labour. This confirms the view of Hecker, and is in opposition to the results of Budin, who found that heads delivered by face presentation returned after a time completely to the normal outline.

Besides the effect of excessive projection of the occiput, by which the leverage of resistance or friction applied to the occiput is increased, the author thinks that light is also thrown upon the mechanism of face presentations by the fact that heads so delivered have an excessive maximum transverse or biparietal diameter. For if this be the case, the head will be most tightly gripped by the brim in the biparietal diameter, its axis of motion relatively to the pelvis will be at this point, or further back than usual, and the effect of the expulsive force will then be to cause extension of the head.—*Obstetrical Journal of Great Britain*, Sept. 1878.

The Treatment of Sore Nipples.

Dr. Haussmann's plan of treating sore nipples by the application of solutions of carbolic acid (see *Monthly Abstract* for September, 1878, p. 425) has recently been tested in the lying-in wards of the Berlin Charité Hospital. Instead, however, of applying strips of lint saturated with the solution, Dr. STEINER directed that the acid should be brought into contact with the sores by means of a camel-hair brush. Forty cases have been thus treated, and with very satisfactory results. A five per cent. solution seemed to be the most efficacious; its application may be said to be painless, it causes only a very slight burning. By means of the brush, the acid can be applied to the smallest cracks, and two or three such daily applications are usually sufficient. A shield, of course, must be used when the child is put to the breast. Dr. Steiner has also tried solutions of thymol (1 to 1000) for a similar purpose, but they were found to be far less efficacious than the carbolic acid.—*Med. Examiner*, Aug. 8, 1878.

Anatomical Researches on the Causes of Sterility.

F. WINCKEL has investigated the generative organs of 150 sterile women dying at a sexually mature age, and finds that, apart from such causes as vaginitis, which could only be ascertained during life, the causes of sterility might be classified as follows: 1. Mechanical obstructions. 2. Chemically destructive influences. 3. Disturbances in the nutrition of the ovaries. In almost all instances two or all of these conditions were present together; as in atresia of the Fallopian tubes, there were firm adhesions of the ovaries; in myomata there was abnormal position, or disease of the mucous membrane, ovarian tumours, etc. He only admits stenosis of the os uteri to be a cause of sterility when follicular catarrh is present with accumulation of mucus in the cervix. It is only in these cases that Winckel forces a passage and applies a caustic to the membrane.—*Lancet*, Aug. 3, 1878.

Mr. Spencer Wells on Ovariectomy.

Mr. SPENCER WELLS has just completed a series of six lectures on ovariectomy at the Royal College of Surgeons. He began by carefully defining his task. "All that I can do," he says, "is to bring before you, in the plainest manner, the results of twenty years' exceptionally large observation and practice . . . and . . . to tell what I have learned about the diagnosis and surgical treatment of abdominal tumours; how I have learned it; the lessons I have been taught by mistakes and failures; the satisfaction which has attended increasing success." These sentences accurately describe the scope of the lectures; beyond the programme thus sketched out they do not go.

The first lecture contains an account of the mode of examining patients with abdominal tumours, and recording their cases. This part is interesting, and fertile in useful hints; but we fancy that every surgeon of large experience soon falls into a method of note-taking suited to his own purpose, and is not likely to bind himself down to the system of any one else, however eminent. Mr. Wells then runs over the different kinds of abdominal tumours which have been, and, therefore, may be, mistaken for ovarian growths, noting the chief diagnostic marks of each. The brevity doubtless imposed upon him by his limited time makes this section, also, suggestive rather than exhaustive. We find some remarks, not so clear as we could wish, upon the chemical and microscopical characters of the liquids drawn from ovarian cysts. "A chemical and microscopical examination of the fluid that is removed," says the lecturer, "will settle any doubt as to

whether it is free peritoneal or ovarian fluid, or fluid of some other cyst." Subsequently, however, he mentions observations which appear to prove that to diagnostic rules based on this mode of investigation there are exceptions. We should have been glad of some more definite statement of the amount of weight to be attached to these facts. Do, or do not, the chemical and microscopical characters of the fluids in question with certainty reveal their origin? To this question we should like to have heard the answer of Mr. Wells.

In the third lecture, we enter upon the lecturer's own special province. He first describes tapping: its history, methods, and the limits of its utility. Here he expresses a decided opinion, and his dictum ought to be, and no doubt will be, recognized as an authoritative rule. "I think," he says, "I have seen quite enough now to warrant me to endeavour to impress upon surgeons that, if the cyst be a single cyst, before they do anything else, they should see what can be gained by one tapping." Then he comes to ovariectomy. The rules which he lays down as to the circumstances under which the operation should be performed are eminently judicious. So long as no great inconvenience is caused by the tumour, the surgeon should hold his hand; but he should not delay operation till the patient's health is so undermined as to compromise success. The mere size of the tumour, and the difficulties met with in the operation, do not so much affect the result as the patient's constitutional condition. The operation should not be associated with a sudden change, from activity and excitement to the monotony and restraint of the sick-room. Almost the only positive contra-indication to an operation is the fact that the patient has some other certainly fatal disease. Even the probability that a tumour is cancerous does not absolutely forbid its removal.

As to the details of the operation, comment is not needed. Mr. Wells's success is the proof of the correctness of his method. We may note, however, that as an anæsthetic he prefers the bichloride of methylene, which he thinks safer than chloroform. In the management of the pedicle his experience is greatly in favour of the clamp. The result to the patient is, he rightly says, the great thing to be considered, the thing with which nothing else can be compared in importance; and tried by this test, the clamp comes out best. The justification of the ligature is, that the use of the clamp is not practicable in every case. The cautery treatment Mr. Wells has found troublesome and uncertain. The necessity for carefully counting forceps, sponges, etc., was impressed upon the listeners by anecdotes narrated at length in a dramatic form.

In the part of his lectures which deals with the treatment of the abdominal wound, Mr. Wells refers to a few valuable experiments which he has made upon living animals. We must say we remark with much regret the apologetic tone in which he thinks it necessary to refer to them. He speaks of his having been accused of cruelty, and protests that the number of experiments he has made is but small. But we think that a man in his position should guide public opinion, and not bend to it. If he do allow himself to be influenced by the prejudices of others, it should be by the opinion of the educated public, the leaders of the scientific world, and not by the excited feelings of amiable, well-meaning, but misinformed persons. Those who, like Mr. Wells, are in the proud position of not only understanding what science is, and how scientific problems are to be worked out, but of possessing the confidence of the public, should use their opportunities to lead people to appreciate science, and should help them to discriminate between those whose knowledge and work make them worthy of being heard, and those obscure seekers after notoriety whose only hope of getting it lies in appealing to the feelings of persons unaccustomed to think. Comparing this passage with one in the sixth lecture, in which Mr. Wells implies that his adoption of the antiseptic method was retarded by the want of some experiments on animals which he would

have liked to make, we think, if he apologizes for anything, that it should be for having so little availed himself of this means of interrogating nature.

A topic upon which the lecturer's remarks are very interesting, is that of the antiseptic system. Hearing and seeing the great results which had attended this method, Mr. Wells thought it his duty to try it; but accidental circumstances prevented his doing so at the time that he had intended, and, going on in his old way, his results became even more brilliant than had attended the antiseptic system elsewhere, and were not subsequently outdone by the new system in Mr. Wells's own hands. This forms an instructive commentary upon the doctrine of *contagium virum*, as expounded by Dr. Roberts, at Manchester. To generate disease, there are not only needed morbid germs, but a soil in which those germs may live and propagate. Listerism (as it is called abroad) aims at, and succeeds in, destroying the germs. But if, by scrupulous cleanliness, these germs can be deprived of any soil in which they can thrive, Listerism is superfluous. This view is borne out, not only by Mr. Wells's experience, but by Mr. Callender's statistics of amputations. Those hospitals in which Listerism has worked the greatest change have been those in which, prior to its introduction, the principles of surgical hygiene have been the least attended to. Safety from wound-poisoning lies in either plan, the greatest security being obviously in the combination of both. We should like to call attention, but have not space to do more, to Mr. Wells's most judicious remarks upon the administration of stimulants after operation. We should also like much to have Mr. Wells's opinion of Battey's operation; for the sake of this, we could even have spared Lord Selborne's calculations, which we fancy we have heard before.

And with respect to uterine tumours, Mr. Wells omits to answer what seems to us the vital question with regard to them: what are the circumstances which render the abdominal removal of a uterine fibroid justifiable? There is one vast difference between these growths and ovarian cysts. Ovarian tumours tend to death: uterine tumours, as a rule, do not. Hence the rule of practice must greatly differ. We should like much to have heard what Mr. Wells thinks on this point.—*Med. Times and Gazette*, Aug. 3, 1878.

Catgut Sutures in Cæsarean Section.

Dr. E. W. JENKS, of Detroit, Michigan, in an article on the use of catgut sutures in Cæsarean section (*Archives de Tocologie*) says: "Theoretically catgut is the best material on account of its unhurtful character and prompt absorption, but practically it will continue to be an indifferent suture until some one has discovered a method of keeping it well secured, for the warmth and humidity of the peritoneal cavity relaxes and opens the common surgeon's knot. I have employed it in a case of ovariectomy to tie the vessels, and the *post-mortem* examination has but too well proven the truth of my last assertion. I have likewise used it during the past few months on several occasions in plastic operations in the vicinity of the vagina, and, in each case, expecting that it would keep the parts in apposition, the result was nevertheless a complete failure. Now, since the only object of uterine sutures in Cæsarean section is to maintain the incised partition walls in contact, to prevent liquids from entering into the uterine and peritoneal cavities, such material only should be employed in cases of this kind as can be invariably relied upon.

"I see by an article, written in an English journal by a writer whose name I cannot now recall, that he claims to have invented a way of making a knot with gut cord, which would neither slip nor untie. I have not tried his method, nor am I disposed, on account of my previous experience, to make my first applica-

tion with it in the abdomen. It would appear that up to the present time we are possessed of nothing superior for uterine sutures to silver wire and silk thread, and of those two the former is probably the best.

“As to the little confidence we can have in gut cord for uterine sutures, I would refer you to the Transactions of the London Obstetrical Society, vol. xvii., where a case of Cæsarean section is recorded by Dr. Oswald; the operation was made by Dr. Routh, who closed the wounds of the uterus with sutures of the best gut cord, firmly tying the same. The patient lived three days after the operation. The *post-mortem* examination revealed that the knot was relaxed and opened, so that a quantity of liquid escaped into the abdominal cavity, poisoning the patient.

“The opinion of Dr. Routh coincides with that of the majority of his colleagues, that had he used sutures of metal or silk, instead of the gut, he could have saved the life of the patient. Dr. Meadows adds, that it was undoubtedly the second case in which death could be attributed to the use of gut cord sutures on the uterus.”—*Michigan Medical News*, June 10, 1878.

MEDICAL JURISPRUDENCE AND TOXICOLOGY.

Examination of Seminal Stains found on the Wooden Floor of a Room.

Dr. GALLARD, in an article in the *Gazette des Hôpitaux*, 1878, No. 44, arrives at the following conclusions: 1. The examination of these stains may give as authentic results as that of stains on linen or clothes. 2. If the semen form a sort of slightly adherent varnish on the floor, the flakes of which are easily separated, the examination is less difficult than when it has to do with linen or cloth, as it is only needful to dissolve the dried semen in a little distilled water. But if the semen have soaked into the wood, a little water must be placed in contact with the stain for a time, and then the wood must be scraped with a scalpel.—*London Medical Record*, Aug. 15, 1878.

Malformations of the Hymen in their Relation to Legal Medicine.

Under this title, Dr. DELENS has published three cases taken from his medico-legal practice. The first is that of a girl $15\frac{1}{2}$ years of age, who was the victim several years ago of repeated assaults, was even afflicted with vulvitis and vaginitis, but yet not deflorated. The integrity of the hymen in this case was explained by its formation. It was thickened to at least 1 millimetre (.04 inch), and was pierced by a hole only 1 millimetre in diameter, and was as resistant as an imperforate hymen. From the absence of laceration it may be inferred that repeated violence was not exercised. The two other cases are very rare examples of biperforate hymen. In one of these cases the two openings were not more than two centimetres (.8 inch) in diameter; in the other, they were seven or eight millimetres by three or four. In cases of this kind the median and solid portion is an obstacle to defloration, which is the more serious as the openings are smaller. The expert should take this circumstance into account.—*London Medical Record*, Aug. 15, 1878.

AMERICAN INTELLIGENCE.

ORIGINAL COMMUNICATIONS.

Femoral Hernia Strangulated on its First Descent; Operation; Recovery. By G. H. BALLERAY, M.D., of Paterson, New Jersey.

I was called March 19th, 1877, to see Mrs. K., German, aged 64, and mother of several children. Not being able to see her at once, I requested my friend, Dr. James C. Amiraux, to visit the patient for me. Upon examination, he found her suffering from strangulated femoral hernia; and he obtained the following history: On the morning of the same day the patient was, as usual, performing her household duties, when, in lifting a scuttle of coal, she felt a sudden and sharp pain in the groin, and on examination, discovered a swelling in that region. The pain increased in severity, notwithstanding the administration of "hot drops," "pain killer," etc., and after a few hours vomiting ensued.

When seen by Dr. Amiraux, at 2 P. M., she was suffering severe pain, and had vomited several times. He endeavoured to reduce the hernia by taxis, but after a faithful trial of over an hour's duration, found it impracticable. Not wishing to assume alone the responsibility of administering an anæsthetic, as the patient had been suffering for some time from a chronic bronchial affection, Dr. A. requested me to visit her with him. I did so, and first attempted the reduction of the hernia without anæsthesia, but meeting with no better success than had Dr. A. previously, I placed the patient under the influence of ether, when another cautious and persevering, but ineffectual, attempt at reduction by taxis was made by both Dr. A. and myself. I then informed the relatives of the patient that an operation would in all probability be required, and having requested Dr. Amiraux to administer a large enema of soap and water, to clear out the large intestine, and afterwards a hypodermic injection of one-third of a grain of morphia, I left, with the understanding that I would return at 7.30 P. M., prepared to operate, should another attempt at reduction by taxis, while the patient was under the influence of an anæsthetic, fail.

At 7.30 P. M. I found the patient extremely averse to an operation, but her consent was finally obtained. She was anæsthetized, and another attempt at reduction by taxis was made by Dr. Marsh, Dr. Terriberly, and myself; but without success. I then proceeded to operate in the presence of Drs. Marsh, Seal, Amiraux, and C. Terriberly. Having cut down to the sac, this was cautiously opened, when about an ounce of brownish-yellow fluid escaped, and a portion of deeply-congested intestine came into view, which was so tightly grasped by the edges of the saphenous opening, which it overlapped in every direction, that it was exceedingly difficult to insinuate the hernia knife beneath the stricture without incurring serious risk of wounding the bowel; with care and patience, however, this obstacle was overcome, and the stricture divided to the extent of about three lines. I then attempted to return the protruded intestine, but did not succeed. At the suggestion of Dr. Marsh, the needle of

a hypodermic syringe was passed into the intestine, and about three drachms of bloody, frothy serum withdrawn; this diminished, to some extent, the tension of the hernial tumour, but not sufficiently to allow of its reduction. I now requested Dr. Terriberry to protect the intestine with his hand, and at the same time to gently draw it downwards, while I carefully passed a director beneath the falciform border of the fascia lata, and divided that structure with a probe-pointed bistoury, to the extent of *over half an inch*; after which, reduction was easily accomplished. So tight was the stricture, and so deep the congestion, that the intestine was perfectly black; but as it still retained its polish, and improved in appearance after division of the stricture, it was returned. The wound was closed, a pad and bandage applied, and the patient put to bed, and only sufficient morphia given to allay the harassing cough with which she was troubled.

The sutures were removed on the morning of the fourth day, and the wound was dressed with lint saturated with a lotion composed of carbolic acid, glycerine, and water. An erysipelatous blush showed itself about the wound on the fifth day, but subsided in the course of two or three days. The bowels were moved by an enema on the sixth day. On the eighth day several petechial spots appeared upon the legs, thighs, abdomen, chest and arms; the pulse became frequent and feeble, and there was a tendency to diarrhœa; but under the influence of iron, quinia, concentrated liquid nourishment, and an increase in the amount of stimulants which it had been found necessary to give from the first, the patient gradually improved; the spots faded away in the course of five or six days, and at the end of the third week perfect convalescence was established.

The points of interest in this case are, *first*, the occurrence of strangulation upon the first descent of the hernia; *second*, the seat of the stricture, and the extent to which it was necessary to divide it, before reduction of the hernia could be accomplished.

As regards the first point, it may be stated that in cases in which strangulation occurs upon the first descent of a femoral hernia, the danger is greater, and more prompt measures for its relief are required than when a similar accident occurs in the case of a hernia of long standing. With reference to this point, Mr. Birkett, the author of the article on hernia in Holmes' *System of Surgery*, says:—

“The mortality arising in cases of strangulated crural hernia of all kinds is very large; but in those where the bowel becomes strangulated *on the first descent*, the death-rate is the largest. The experience of a large number of these cases teaches that the bowel should be liberated as soon as possible, and, if the taxis be not successful when the patient is fully under the influence of chloroform, that the cutting operation should not be delayed a moment.”

In this case, had the operation been delayed until the following morning, the bowel would have been gangrenous, and in all probability the patient would have died. The stricture was formed by the dense, unyielding structures surrounding the saphenous opening. The division of the femoral (Hey's) ligament did not liberate the intestine, and it was only after free division of the falciform process of the fascia lata that the bowel could be returned. Gimbernat's ligament played no part in the production of the strangulation.

DOMESTIC SUMMARY.

Induction of Premature Labour in the Albuminuria of Pregnancy.

In a short article in the *American Journal of Obstetrics* (July, 1878), Dr. FORDYCE BARKER earnestly advocates the non-induction of premature labour in the albuminuria of pregnancy until after appropriate treatment has been thoroughly and perseveringly tried without success for the removal of symptoms of albuminuria of so grave a character that there is strong probability that their continuance would result in the death of the patient.

Treatment of Eczema Rubrum by means of Glycerole of the Subacetate of Lead.

The use of glycerole of the subacetate of lead as an application in chronic eczema rubrum was first brought prominently to the notice of the profession by Mr. Balmanno Squire, of London.¹ But up to the present time this plan of treatment has not attracted as much attention, in this country at least, as it deserves. Drs. DUHRING and VAN HARLINGEN have been using the glycerole in their dispensary practice for the past six months, and the results which they have obtained (*Phila. Med. Times*, Aug. 3, 1878) are of so favourable a character as to suggest a further and more extensive use of this remedy in the class of diseases to which it is applicable.

For an account of the theory of action of the glycerole, reference may be made to Mr. Squire's papers. The formula which he suggests is as follows:—

Acetate of lead, 5 parts;

Litharge, $3\frac{1}{2}$ parts;

Glycerine, 20 parts, by weight.

Mix, and expose for some time to a temperature of 350° F. Filter through a hot-water funnel. The clear viscid fluid resultant contains 120 grains of the subacetate of lead to the ounce. It is used as a stock from which the preparations employed are made by dilution with simple glycerine.

The results obtained in their series of cases and also in others coming under their observation during the last six months, led to the following conclusions. In glycerole of the subacetate of lead we have a valuable addition to the therapeutics of certain forms of chronic eczema, particularly eczema rubrum of the lower extremities. It is most useful in those cases where the affection is extensive, of a dusky hue, accompanied by much weeping, oozing, and infiltration of the skin, together with swelling and œdema of the subcutaneous tissues, and a full and varicose condition of the venous circulation. In such cases glycerole of the subacetate of lead, used with diligence, and followed by careful bandaging, constitutes a remedy of the highest value.

Glycerole of the subacetate of lead has not, however, any anti-pruritic qualities, excepting in so far as it may reduce the œdema which sometimes appears to give rise to pruritus. Nor has it any resolvent effect upon infiltration of the more superficial layers of the integument. In this respect it fails just in those cases and at that stage of eczema rubrum where the skin is no longer acutely inflamed, but is thickened, indurated, and pruriginous; in other words, where ordinarily the preparations of tar and potash are most useful.

Glycerole of the subacetate of lead fails, moreover, to exert a favourable influence in those cases of eczema rubrum where the disease shows itself in numerous variously-seized superficial patches, and where the deeper layers of the skin do

¹ Medical Times and Gazette, 1876, vol. i., March 18 and 25, and Essays on the Treatment of Skin Disease, No. 2 (second edition), London, J. & A. Churchill, 1878.

not appear to be affected. With regard to its effect in the vesicular and squamous varieties of eczema, this is not satisfactory, and it is less favourable in proportion as the case departs from the typical form of eczema rubrum.

Occasionally the glycerole is found to disagree with the skin. This, however, does not often happen, at least not nearly so often as in the case of glycerine.

—

Ligation of the Lingual Artery near its Origin, as a Preliminary Procedure in the Extirpation of Cancerous Disease of the Tongue.

Dr. GEORGE F. SHRADY, Surgeon to the Presbyterian Hospital, New York, reports (*Med. Record*, Sept. 14, 1878) a case of epithelioma of the tongue in which the lingual artery was ligated near its origin, as a preliminary procedure in the operation for extirpation of the disease, and he submits the following conclusions to which he has been led by a careful consideration of the case:—

1. In cancer of the tongue, whenever it is possible, the disease should be removed through the mouth.
2. Ligation of the lingual artery is a very necessary preliminary to such a procedure.
3. Ligation of the lingual artery, if performed at all, should be near the origin of the vessel, as by that means the whole of the blood-supply of one side of the tongue is completely cut off.
4. The operation of ligation of the lingual artery, even in that situation, is less difficult than the securing of the vessel in the wound during the operation of extirpation of the tongue, and when there is free hemorrhage deep in the mouth.
5. The distance between the external carotid and the point of ligature is sufficient for the foundation of a firm clot and the prevention of secondary hemorrhage.
6. The use of the scissors and the knife places the wound in a condition more favourable for rapid healing than when the *écraseur* or any variety of cautery is used.
7. Ligation of the lingual may have a tendency to retard the return of the disease.

—

The Unequal Length of Normal Limbs shown by Measurement of the Skeleton.

A good deal of attention has been recently directed to the inequality in the length of the lower limbs, and a number of observations have been made by Drs. Cox and Wright on the living body to demonstrate this. Dr. JOHN B. ROBERTS has recently (*Phila. Med. Times*, Aug. 3, 1878) made accurate measurements of the femora and tibiæ of eight skeletons in the museum of the Jefferson Medical College and elsewhere, in the following manner. He took an ordinary graduated yard-stick, and had a piece of iron fixed to one end at a right angle, while up and down the stick there played a slide with a similar piece of iron also at a right angle. This was employed just as a shoemaker uses his rule to obtain the length of his customer's foot. The results show an inequality in each skeleton varying from an eighth to three-quarters of an inch.

In commenting on these results Dr. Roberts says: "These figures show conclusively to my mind the folly of endeavouring to make the limbs of equal length after one of them has sustained fracture; it may be possible if the patient happens to break the long leg, but what will be the result if he have this accident occur to the one already half an inch shorter than its fellow? Is the surgeon to continue his extension until both legs reach the same mark on his graduated tape? Especially is this to be deprecated when we recollect the probability of his measurements differing every day on account of the difficulty of applying the tape to exactly the same spot on each side."

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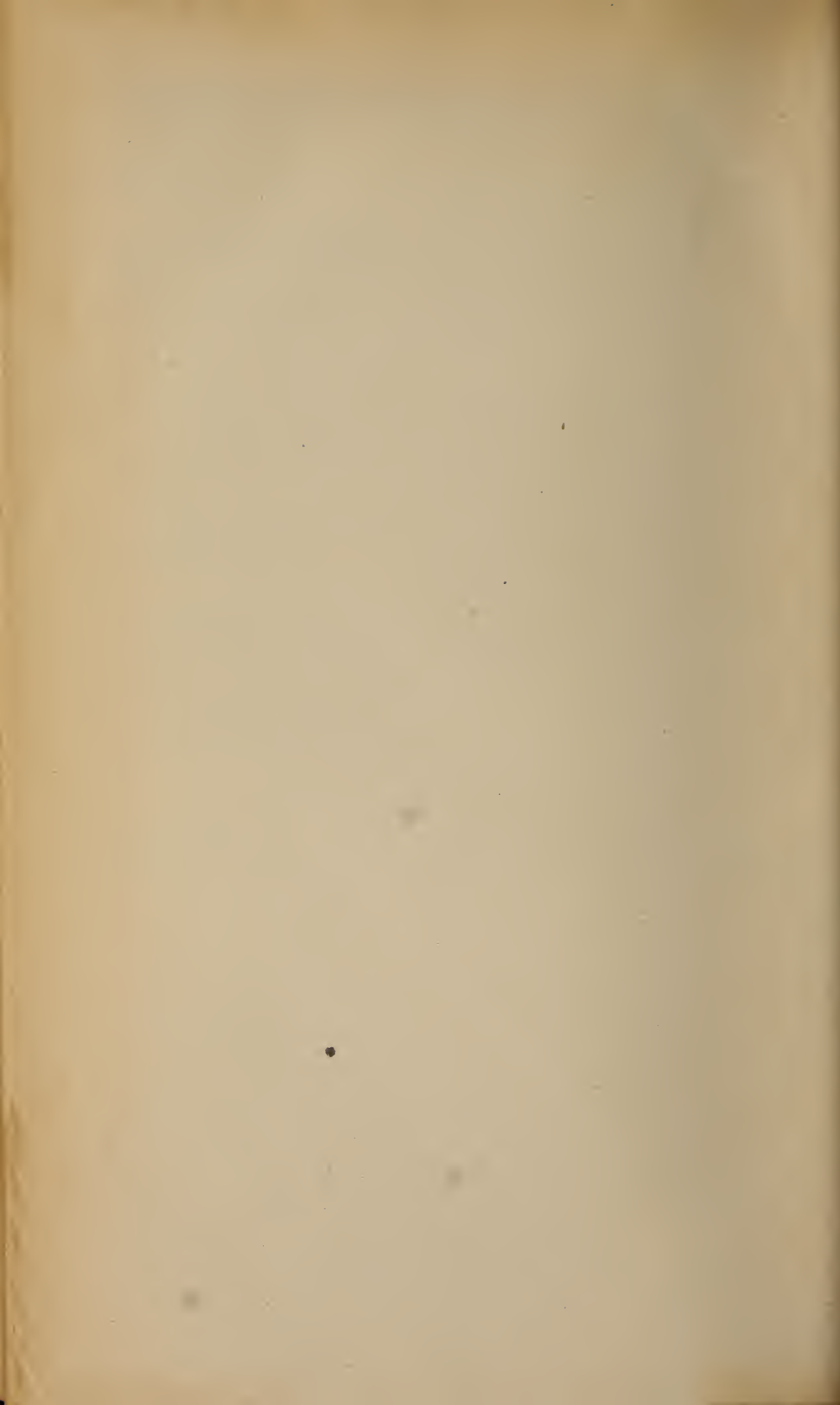
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